U.S. PROCESSING/NETWORK SERVICES MARKETS 1983 - 1993

INPUT

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INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions.

Continuous-information advisory services, proprietary research/consulting, merger/acquisition assistance, and multiclient studies are provided to users and vendors of information systems and services (software, processing services, turnkey systems, systems integration, professional services, communications, systems/software maintenance and support).

Many of INPUT's professional staff members have more than 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

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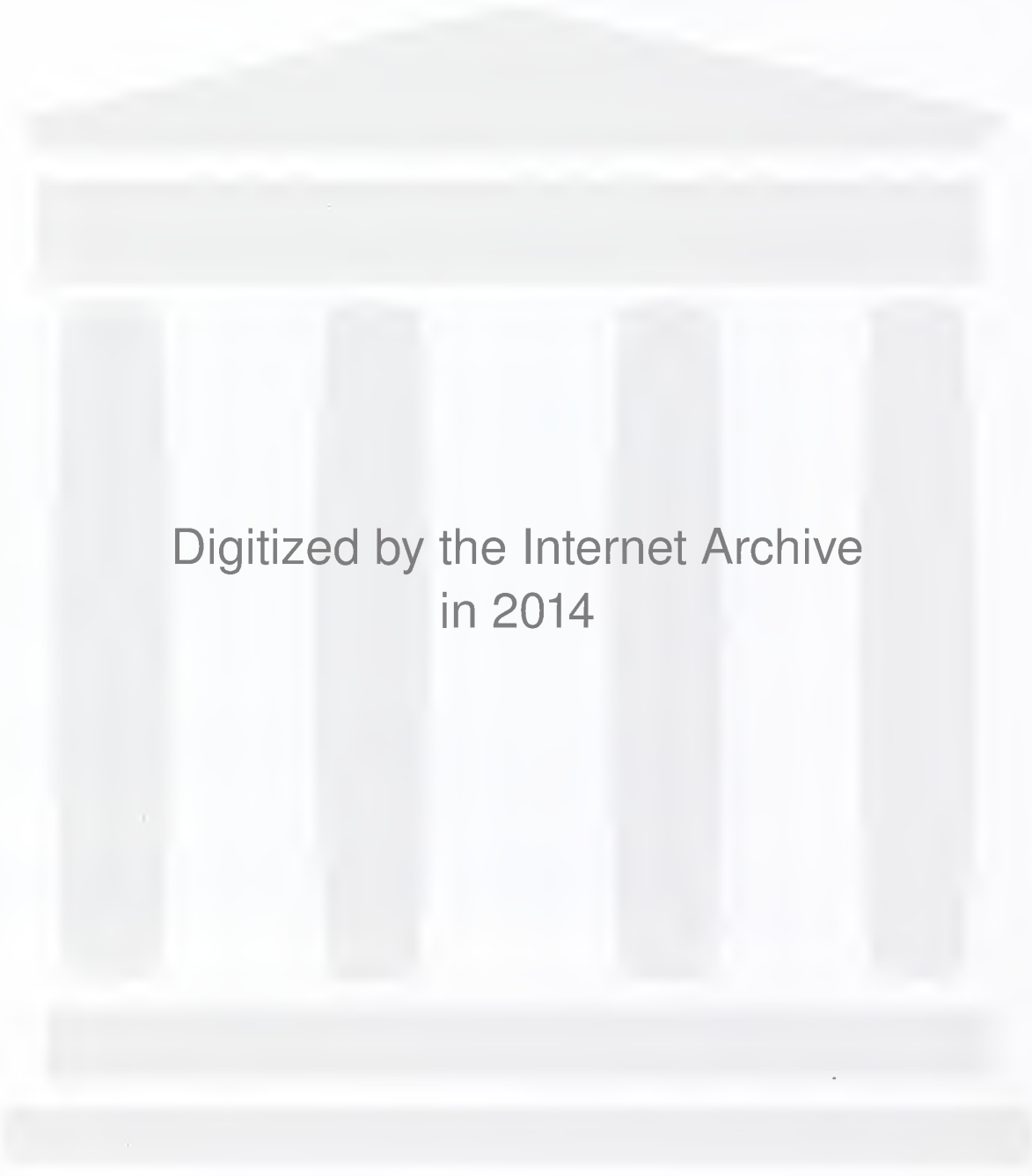
Abstract

The INPUT 1988 *Processing/Network Services* annual report provides analysis and five-year forecasts of these two U.S. markets for the period 1988-1993. The forecasts contained in this report segment the processing services market into transaction processing, utility processing, other processing, and systems operations (facilities management) categories. The network services forecast is segmented into (1) network applications and (2) electronic information services categories. Network applications is further segmented into value-added networks, electronic data interchange, and electronic mail. Electronic information services is further segmented into on-line data bases, news data bases, and other services.

The five-year forecast period, using the base year 1987, covers fifteen different industry-specific and seven cross-industry markets. Twenty-two vendors are profiled in the report, and leading vendors' shares of the two major markets are provided.

The report also discusses issues and trends and provides recommendations on how vendors can take advantage of the key forces driving the market.

The report contains 178 pages and 63 exhibits.



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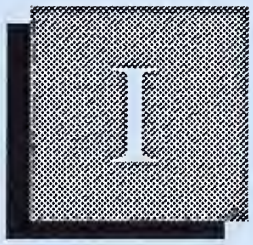
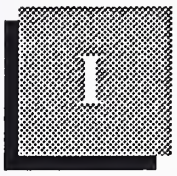


Introduction



Introduction

A Purpose of This Report

In prior years, INPUT reported on the processing and network services markets as a single industry sector. To reflect the rapid growth of network services in the last few years, INPUT now separates these and will treat them as individual topics within the confines of this single report in 1988.

This report covers the processing services and network services segments of the information services industry, for the period 1988-1993. Included in this report are descriptions of the issues, trends, and events driving these markets, a detailed five-year forecast of the markets and their subsets, a description of the forces that drive or inhibit the markets, a discussion of leading vendors, their activities, and market shares, and opportunities and recommendations for vendors to effectively leverage their presence in these markets.

The report provides readers with information and insights that will allow them to:

- Review the forces that are shaping the market
- Identify new markets and possible product opportunities
- Assess the product penetration of competitors
- Determine potential market directions
- Assist in prioritizing investment dollars

B Scope of the Report

The report covers all aspects of the processing services marketplace: transaction services, utility services, other processing services, and systems operations (facilities management) with vendor-owned equipment. Network services are similarly covered, including the subsets of value-added networks, electronic data interchange (EDI), electronic mail, and electronic information services and data bases.

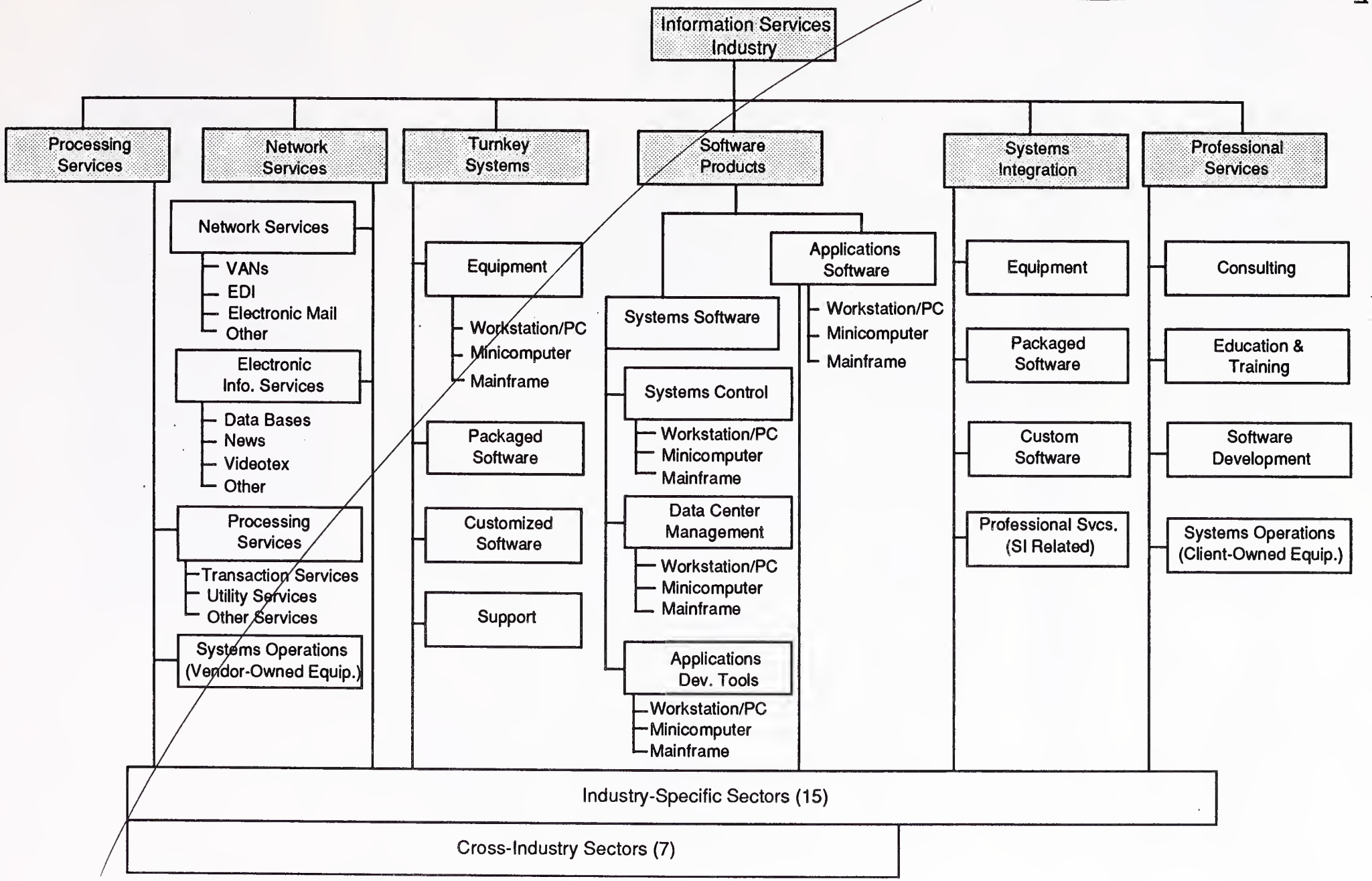
- The report is organized into several chapters, as follows:
  - Chapter I is the Introduction, describing the report contents, purpose, scope, and methodology.
  - Chapter II is the Executive Overview, designed to provide the reader with a summary of the report.
  - Chapter III examines all segments of the two markets and provides information on issues, trends, and key events.
  - Chapter IV provides five-year forecasts for all service delivery modes, submodes, and industry sectors.
  - Chapter V describes the activities, strategies, and market shares of leading vendors in all market segments.
  - Chapter VI discusses opportunities and recommendations for vendors in the processing/network services markets.
  - The appendices contain the data base forecasts for each of the markets, reconciliation with prior forecasts, and INPUT's definitions.

C

Information Services Industry Structure

Exhibit I-1 defines the scope of the information services industry that is tracked and analyzed by INPUT. There are six major delivery modes shown in that exhibit. In past years there were only four. One change is that processing/network services, which was a single category, has now been divided in two. Also, professional services previously contained a submode for systems integration. The rapid growth of systems integration has prompted INPUT to create a separate market category and report written specifically for this category. Exhibit I-1 shows all delivery modes and submodes currently tracked by INPUT. Annual market reports are written for each of the delivery modes shown, and detailed discussions included of all submodes.

INFORMATION SERVICES INDUSTRY STRUCTURE 1988

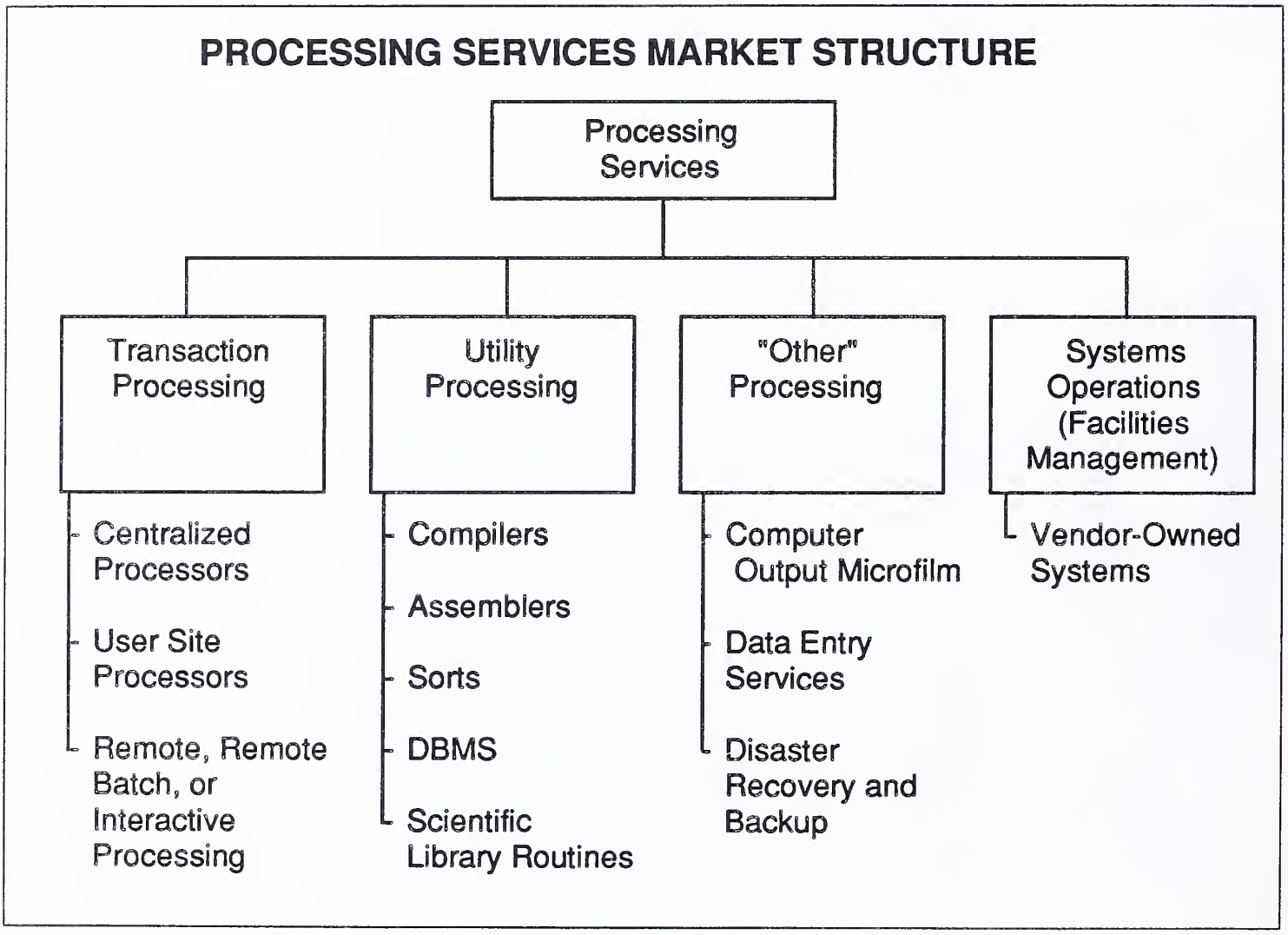


D

Processing Services Market Structure

The processing services market structure is described in Exhibit I-2. The four submodes are indicated with examples of those services beneath them.

EXHIBIT I-2



The largest segment in this market, transaction processing, refers to the input, updating, and reporting from customer files and records resident in a system not owned by the client. Such systems may be centralized at a vendor location or distributed at client sites; the key is that they are not customer-owned or operated. Transaction processing includes common business applications such as accounts receivable, payroll, inventory control, manufacturing planning, and accounting. It also includes more-specialized services like airline reservations, hospital patient care, and medical claims processing. The primary criterion for a service being

included here is simply that a transaction occurs and the user's files are updated in some way as a result of that transaction.

"Other" processing services are a collection of specialized services not closely related, but categorized together for convenience. These include computer output microfilm, disaster recovery and backup, carry-in and batch, and data entry.

Utility Processing is more straightforward. It includes the use of vendors' computers for a wide variety of processes that enable users to solve computational problems and develop computer programs of their own.

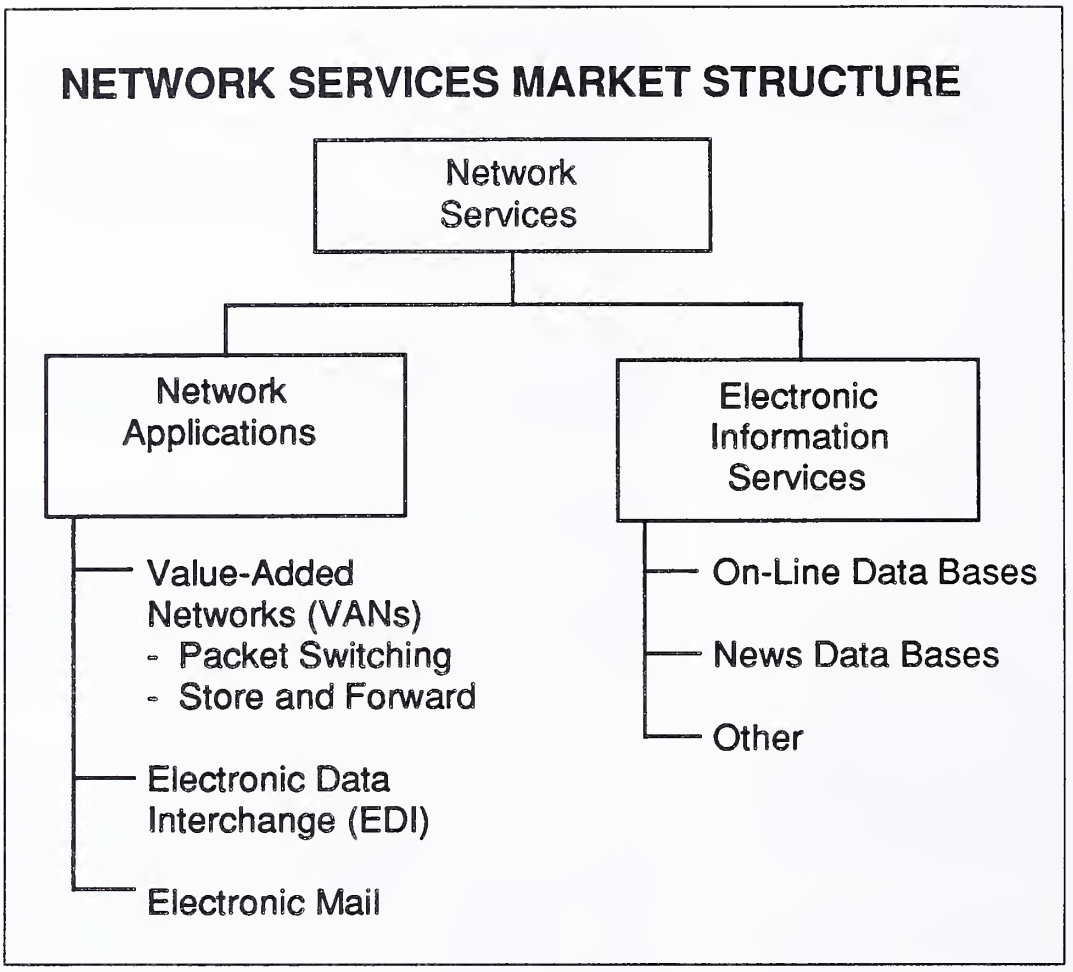
Systems Operations has been referred to in prior INPUT reports as facilities management. Specifically, this reference is to systems operations where the vendor provides the computer systems necessary for the operation. In cases where the client owns the computer systems that are so employed, INPUT identifies those revenues as a part of the professional services market.

E

Network Services Market Structure

The network services market is divided into two major segments. The first, network applications, includes value-added networks, electronic data interchange (EDI), and electronic mail. The second segment, electronic information services, includes on-line data bases and news data bases. The fundamental criterion for services in this category is that the network itself must play an important enabling function; without the network this service could not be provided. The structure of the network services market and examples are shown in Exhibit I-3.

EXHIBIT I-3



F

Research Methodology

INPUT methodology for data collection, analysis, and forecasting is shown graphically in Exhibit I-4. During the second quarter of 1988, INPUT conducted in-depth interviews with 910 information services vendors, including nearly all of the largest 250 firms. The smallest of the 250 generated about $20 million in U.S. noncaptive 1987 revenues.

Of the 910 companies, the smaller 660 ranged in size from $250,000 to $20 million in revenues. Revenues from all 910 firms represented 70% of the total information services industry revenues.

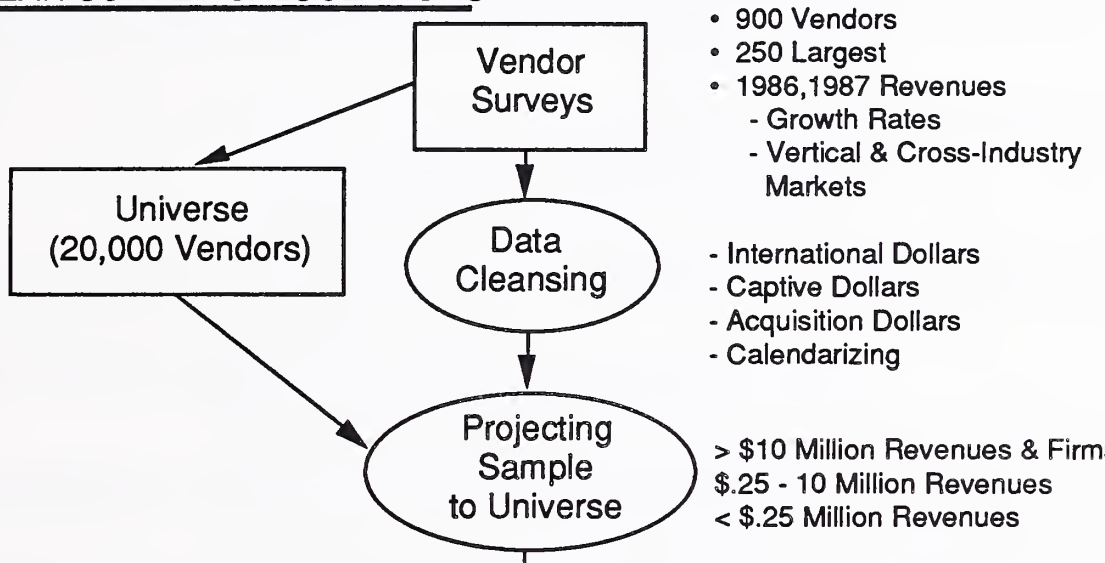
For the minority of larger vendors where revenues were not available, INPUT estimated these revenues from its own contacts and secondary sources. This was done for all identified firms with greater than $10 million in annual revenues.

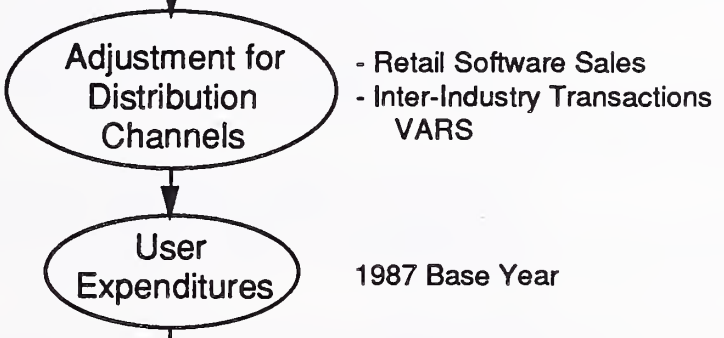
For smaller firms, with revenues below $10 million (and not specifically covered in the survey), INPUT created its own estimates based on the number of such firms identified in each delivery mode and the average annual revenue anticipated for such firms.

EXHIBIT I-4

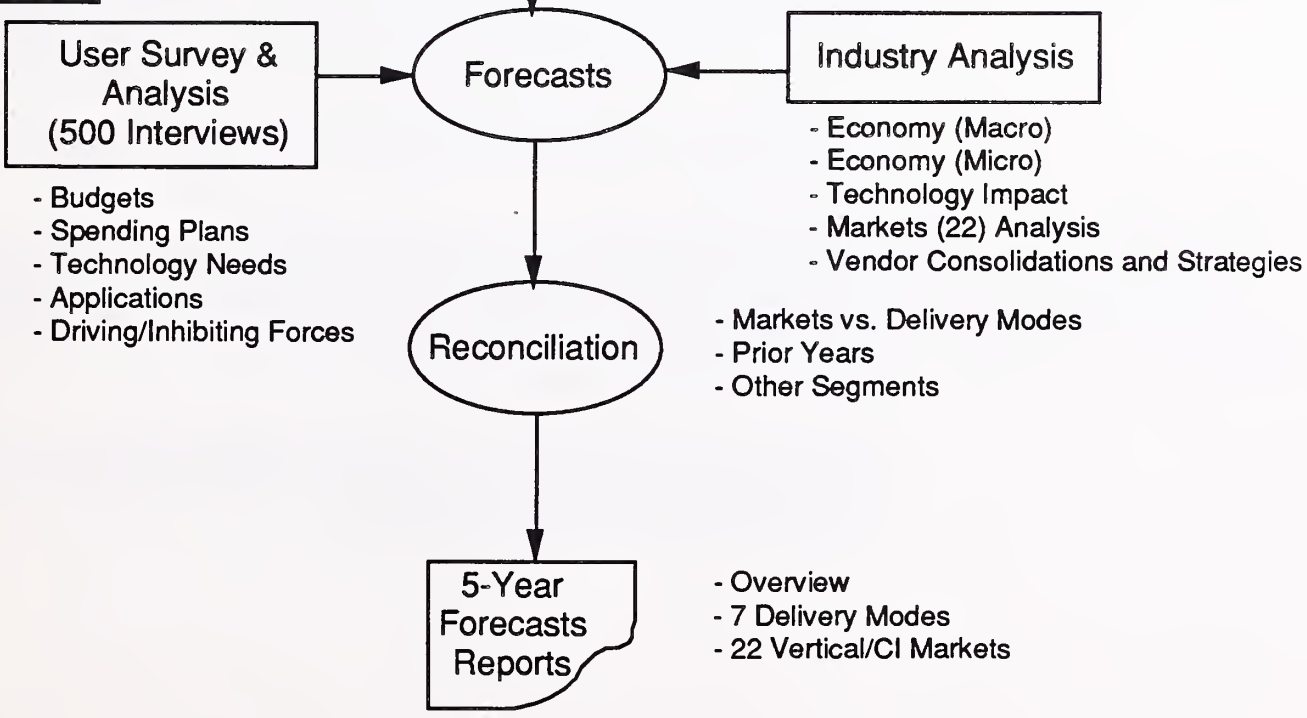
INPUT RESEARCH METHODOLOGY

I. BASE YEAR SURVEY CALCULATIONS





II. FORECASTS



The sum of these surveys and estimates produced the initial vendor revenue estimates for 1987. From this figure, INPUT subtracted revenues identified as:

- International (non-U.S.)
- Captive within any organization
- Acquisitions (only for growth rate calculations)

The revenue data in this report includes only the following:

- U.S. revenues—Revenues derived from products or services sold in the U.S. only. All foreign revenues are excluded.

- Information services revenues—Revenues from processing and network services only.

- Noncaptive revenues—Only revenues available to all vendors in a competitive marketplace are included. Revenues derived from sales to the partners of affiliated organizations are excluded. An example would be the sale of processing services to Boeing from Boeing Computer Services.

- Calendar year revenues—Approximately 30% of the vendors surveyed have fiscal years that do not coincide with calendar years. Revenues of these companies have been adjusted to a calendar year basis for consistency.

- Rounding to the nearest $1 million for specific vendors was done to normalize for the lesser degree of accuracy of data estimated by INPUT.

- Revenues reported by private companies, subsidiaries of larger corporations, computer manufacturers, and CPA firms are generally subject to a wider margin of error than revenues of other companies.

Companies not exclusively involved in information services are identified as follows:

- If a division or its subsidiary markets all information services for a company and is generally known by the name of that group, then it is identified by that name rather than the parent's name. An example is Boeing Computer Services Company.

- If more than one division or subsidiary markets information services, the information is included in, and identified by, the parent's name. An example is Control Data Corporation.

- Organizations are reported according to their legal status as of the end of December 1987.

Companies have been classified according to the delivery mode of service from which they derive the largest proportion of their U.S. non-captive information service revenues.

Total base year (1987) revenues are then separated into six delivery modes, and also into twenty-two vertical/cross-industry segments, for closer analysis.

INPUT considers industry revenues to include two separate subsets of data: (1) *user expenditures*, which equate with market size, and (2) *vendor revenues*. For certain delivery modes, vendor revenues and user expenditures are fairly close. However, many microcomputer software products, for example, are marketed through indirect distribution channels, such as retail stores, OEMs, and VARs, where conversion factors must be applied to determine the total market size from vendor revenues. In addition, some software is sold into other information services sectors, such as processing and network services. This software could be used in these processing services firms' data centers and never passed on to an end user. INPUT deletes such intraindustry transactions from its user expenditures market.

The following table shows the various conversion factors used by INPUT to convert 1987 vendor revenues to end-user expenditures (market size) figures for each delivery mode:

Application Software	1.18 (reflecting retail stores, etc.)
Systems Software	1.10 "
Turnkey Systems	.99 (a reduction due to intraindustry transactions)
Systems Integration	.99 "
Professional Services	.99 "
Network Services	.99 "
Processing Services	.99 "

For the 1987 user expenditures thus defined, INPUT projects five-year market growth rates for each delivery mode and vertical/cross-industry market, based on its own analysis of technology, economic outlook, vendor activity, and driving and inhibiting forces affecting each market.

G

Economic Assumptions

In developing the five-year forecast, INPUT has incorporated the following economic assumptions regarding the outlook for the total U.S. economy, and the impact on the various delivery modes within the information services industry. Details are in Exhibit I-5.

EXHIBIT I-5

GNP NOMINAL GROWTH RATE ASSUMPTIONS

	Percent						
	1987A	1988A	1989E	1990E	1991E	1992E	1993E
Real GNP	3.4	3.8	2.8	2.5	2.8	3.0	3.0
*GNP Deflator	3.3	3.4	5.5	5.0	5.0	4.5	4.5
Nominal GNP	6.7	7.2	8.3	7.5	7.8	7.5	7.5

*Year-to-Year Comparisons

INPUT projects that the total information services market will expand at a 17% compound annual growth rate (CAGR) over the next five years, from $79 billion in 1988 to $173 billion in 1993. For 1987, the information services market totaled $67 billion, representing a 20% growth rate over 1986. The 1987-1988 growth rate is expected to be 18%.

This modest decline in the anticipated annual growth rate reflects INPUT's projection of a slowing in real GNP growth over the next two to three years. Real GNP growth is projected to decrease to a range of 2.5% to 2.8% over the next three years before returning to approximately current levels in the early 1990s. In addition, the inflation rate, as measured by the GNP deflator, is expected to increase modestly between 1988 and 1989, and then stabilize at a level in line with the current estimate of 4.5% for 1988.

Primary expectations affecting INPUT's outlook for nominal GNP growth rates over the next five years include a continuing slowdown in consumer spending, related to modest increases in real consumer income; further slowing in the rate of increase of federal defense spending, related to the need to reduce the federal budget deficit; product-cycle maturation in certain key technology sectors, such as the low end of the personal computer market and in minicomputers; and higher interest

rates, particularly in the near term, reflecting pent-up inflationary cost pressures.

Historically, the information services industry has been more resilient to slowdowns in real GNP growth (reflecting unit shipments) than have companies in the electronic components and equipment sectors. However, the ability to pass on inflationary pricing pressures is more varied in the information services industry, reflecting the particular labor/material mix in the cost structure of individual delivery modes.

As shown in Exhibit I-6, INPUT's forecasted growth rates for the information services industry include assumptions concerning the impact of changes in real GNP and inflationary growth rates on the industry's different delivery modes.

EXHIBIT I-6

GROWTH RATES BY DELIVERY MODE

PROCESSING SERVICES

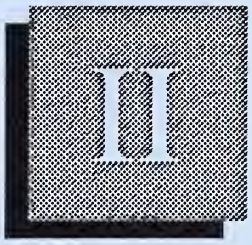
	Percent						
	1987A	1988E	1989E	1990E	1991E	1992E	1993E
Real Growth	11.0	7.9	7.0	7.5	6.5	6.9	6.9
Price Deflator	3.0	4.1	5.0	4.5	4.5	4.1	4.1
Nominal Growth	14.0	12.0	12.0	12.0	11.0	11.0	11.0

NETWORK SERVICES

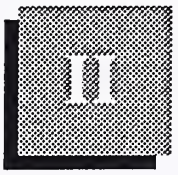
	Percent						
	1987A	1988E	1989E	1990E	1991E	1992E	1993E
Real Growth	25.0	20.9	20.0	18.5	18.5	17.9	17.9
Price Deflator	3.0	4.1	5.0	4.5	4.5	4.1	4.1
Nominal Growth	28.0	25.0	25.0	23.0	23.0	22.0	22.0

- Processing Services—Includes a variety of applications looked upon as mission-critical services for company operations. With an estimated 50% mix in labor/equipment cost base, processing services companies should be able to pass along much of labor-related inflationary cost pressures. The industry has experienced a relatively stable growth rate in recent years following the prolonged downturn in the 1970s prompted by the decline in traditional timesharing business.

- Network Services—A 50% mix in the labor/equipment cost base is also applicable for network services. This delivery mode is expected to achieve the second-fastest growth rate within the total information services market, fueled by the strong growth of on-line data base services, EDI, and VANs.



Executive Overview



Executive Overview

A Overview

The processing and network services delivery modes are two of the six delivery modes that make up the information services industry. As shown in Exhibit II-1, the information services market is projected to grow at a rate of 17% from 1988 to 1993.

The processing services sector, a more mature market built on the rapid growth of timesharing and remote processing in the 1970s and early 1980s, has flattened in growth to a 12% rate during 1988 and is also forecast to grow 12% during 1993. The network services sector, by contrast, is composed of newer, emerging markets such as electronic data interchange and on-line data bases and will experience a more dynamic growth rate of 23% during the forecast period.

EXHIBIT II-1

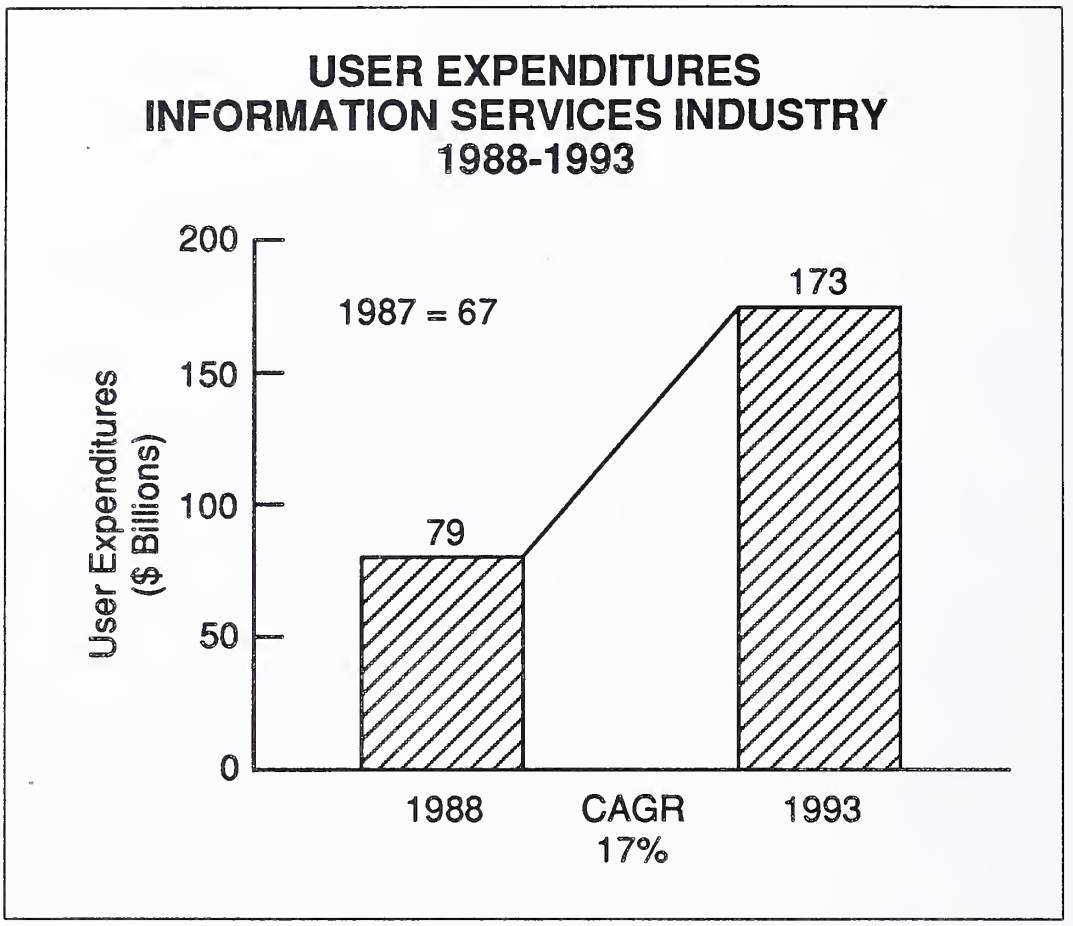
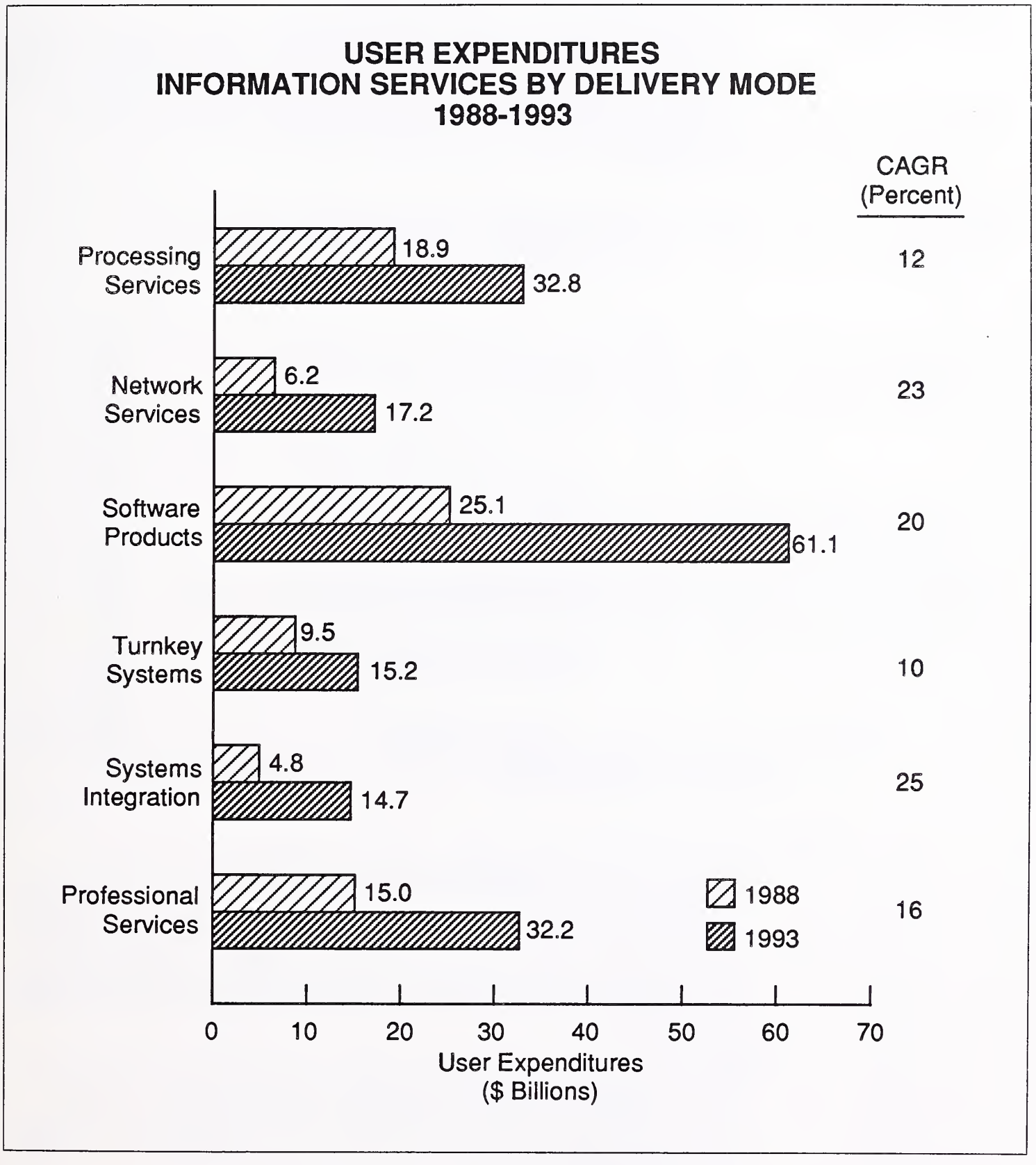


Exhibit II-2 makes the obvious point that software (systems plus applications software) will represent the primary growth opportunity for the 1990s. However, this report will identify specific areas of opportunity for vendors to achieve revenues and profits within the processing and network services sector.

EXHIBIT II-2



B

Processing Services

1. Driving Forces

Despite frequent predictions of their imminent demise, processing services (transaction processing, utility processing, systems operations, COM services, disaster recovery, carry-in batch, and data entry services) continue to grow. The reasons for this viability are summarized in Exhibit II-3.

EXHIBIT II-3

PROCESSING SERVICES MARKETS DRIVING FORCES

- Current User Inertia Change
- Outsourcing Trends
- Industry-Oriented Solutions
- Time-Critical Solutions
- Systems Integration Project Completion
- Innovations by Vendors
  - Disaster Recovery

First, many current users of processing services find it convenient to continue having a third party process specific applications of functions, using expertise or facilities the customer does not possess. This inertia has allowed several large processing services to grow steadily over the past few years. In fact, ADP, the industry leader, has reported double-digit quarterly growth in revenues and profits for more than 108 consecutive quarters.

Second, the trend for outsourcing continues to exist. Many businesses make conscious decisions not to process new work in their own data centers, and use outside vendors because of development time required, additional computer resources needed, operational expertise, or a combination of these.

Third, innovative vendors continue to create industry-specific applications geared to the needs of clients who have become more sophisticated and want solutions keyed to their own businesses. Vendors who anticipate such needs, and can deliver products with more capability than users can create in-house, will find receptive buyers.

Processing services vendors are able to offer solutions today. For a user with a large backlog of applications in the queue for the in-house development staff, this immediacy can present an attractive alternative.

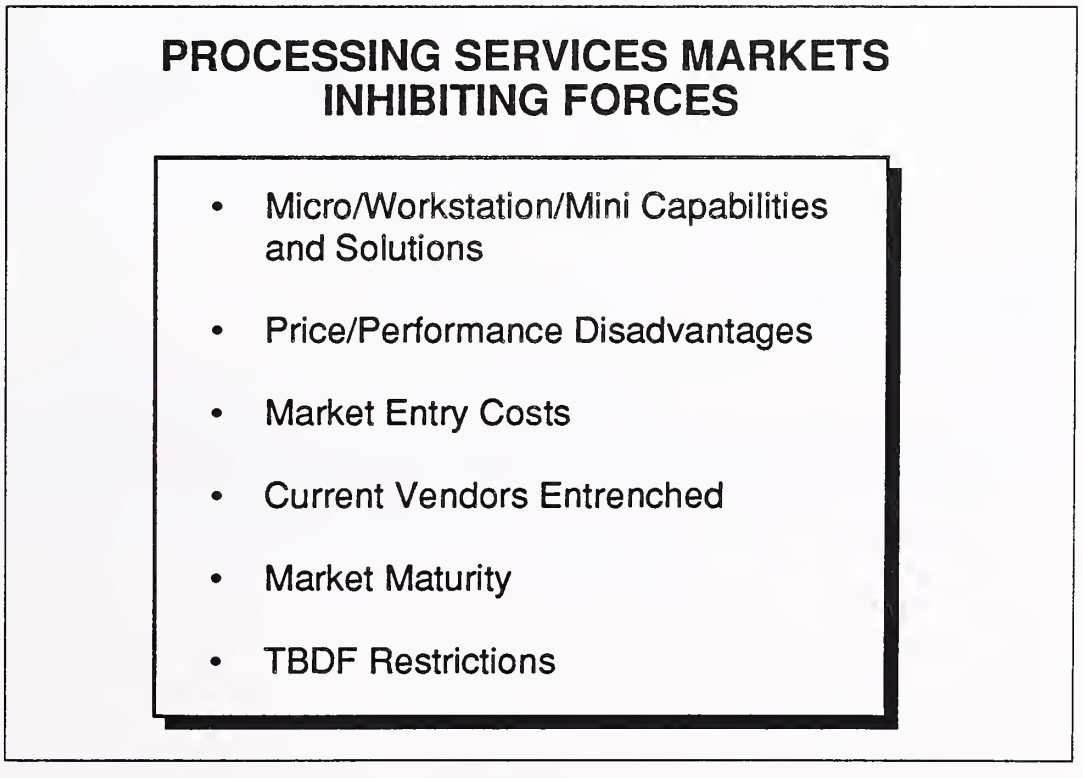
The completion of complex systems integration projects will create additional demand for systems operations contracts, as users realize that the organizations most capable of running such systems are the vendors that built them.

Finally, the innovations that have characterized this industry from its inception continue to fuel market growth. New ideas, such as disaster recovery services, can be quickly accepted by large numbers of users.

2. Inhibiting Forces

However, the factors working against industry growth and success are widely recognized, as shown in Exhibit II-4. Increasingly powerful workstations and personal computers have continued the trend toward cost-effective in-house alternatives begun by minicomputer vendors in the 1970s. As more PC/workstation applications become widely available, this will increase pressure on the processing services vendors offering comparable solutions.

EXHIBIT II-4



The availability of PC and workstation software is of course propelled by the still-falling cost of computer hardware. The price-performance ratios of these systems attracts many software developers, both inside IS departments and among software vendors. In both cases, pure processing services vendors are potential losers to these alternative approaches.

Market entry costs are likely to be high; computers and systems software required to serve a large number of users is expensive, and the time required to develop specific, dependable, and feature-rich software also converts to high costs. INPUT expects that most firms seeking to enter the information services industry may choose software development and professional services as the paths of least resistance and lowest cost.

A number of powerful vendors are well-entrenched in their specific markets, making it difficult for new entrants to achieve significant market share. This requires that new entrants pick their target markets very carefully and identify their primary competitors.

The processing services market is mature, and much of the rapid growth expected from an emerging market has already been achieved. With a $19 billion base, a slowly declining growth rate is likely in the 1990s.

Finally, international processing services opportunities are likely to be constrained by trans-border data flow (TBDF) restrictions on the part of various governments

3. Leading Vendors

The leading vendors in the processing services market are shown in Exhibit II-5. These are ranked in 1987 revenue sequence. (See Chapter V for details on specific vendors.) Processing services has created some very large vendors. Of the six firms generating more than one billion dollars in revenue from the information services industry, three (ADP, EDS, CSC) achieve very significant revenues from this sector. The top 13 vendors control 26% of the industry's revenue.

C
Network Services

1. Driving Forces

The network services market is divided into two categories: (1) network applications and (2) electronic information services. Network applications consists of value-added networks (VANs), electronic mail, and electronic data interchange (EDI). Electronic information services consists of on-line data bases, news data bases, and other services such as videotex.

EXHIBIT II-5

LEADING VENDORS REVENUES AND MARKET SHARES PROCESSING SERVICES MARKET, 1987

Company Name	1987 U.S. Revenue ($ Millions)	Market Share (Percent)
Automatic Data Processing, Inc.	1,040	6
EDS Corporation (& MTech)	820	5
Control Data Corp.	440	3
CSC Corporation	380	2
First Data Resources, Inc.	320	2
Shared Medical Systems Corp.	275	2
McDonnell Douglas Information Systems Group	230	1
First Financial Management Corp.	175	1
National Data Corporation	155	1
GE Information Services Co.	150	1
IBM	145	1
NCR	140	1
Systematics	130	1

These markets are newer and faster growing than the processing services segments. There are a number of reasons for this difference, as outlined in Exhibit II-6.

EXHIBIT II-6

NETWORK SERVICES MARKET—DRIVING FORCES

- PC Population
- Consumer Information Services
- ISDN
- EDI Popularity
- Wide-Area Networking
- Business Need for Rapidly Available Electronic Information
- RBOC Entry
- Network Management Services
- Voice Information Services
- Global Economic System
- Global Network Infrastructure

A primary driving force in network services is the sheer number of PCs installed—about 15 million in the U.S. alone. The potential demand for these PCs to link into networks and access on-line information sources and services is still largely untapped. For example, Compusource, a leading supplier of consumer-based services, has 450,000 subscribers. Dow Jones has 250,000 subscribers to its news and information retrieval services. The vast majority of PCs are still used on a standalone basis, and consumer-based services are used by only a small percentage of these PC owners.

Integrated Services Data Networks (ISDN) will arrive in the 1990s from RBOCs that are eager to share in the network services market. ISDN will provide integrated voice/data networks that facilitate easier transmission of information and may accelerate multi-mode communications activity. Bellcore has identified 118 applications available now to run under an ISDN environment. The bulk are voice-oriented, but some relate to packet-switched interfaces and services. These latter present an opportunity for network services vendors to adapt their VANs to include such capabilities. It is not fully clear how information services vendors can share in the opportunity, but ISDN is a trend to be monitored.

Electronic Data Interchange (EDI) is a fast-growing market segment that enables businesses to pass documents to one another on an electronic, application-to-application basis. The business advantages available to organizations using this timely communications method have created high demand for EDI.

Wide-area networking is the logical extension of local-area networks (LANs). Wide-area networks will tie together LANs in tactical communications systems within an organization and between separate organizations. Wide-area networks will promote network services growth in the 1990s.

Businesses, to remain competitive, are increasingly in need of immediate information, which can often be best accessed through electronic data bases.

The Regional Bell Operating Companies (RBOCs) and Bell Operating Companies (BOCs) are eager to enter this market. Although they are currently restricted by Judge Greene's rulings and cannot provide the actual content of data bases, they can provide networks and gateways, facilitate such access, and move aggressively into these areas during the 1990s. A relaxation of the RBOC legal restrictions would certainly lead to a more aggressive competitive posture from the RBOCs.

The complexity of communications networks is increasing rapidly. Few organizations possess the knowledge to operate and maintain these networks by themselves. Business opportunities exist in providing network management skills and control in a variety of ways: remote network management services, software, and professional consulting services.

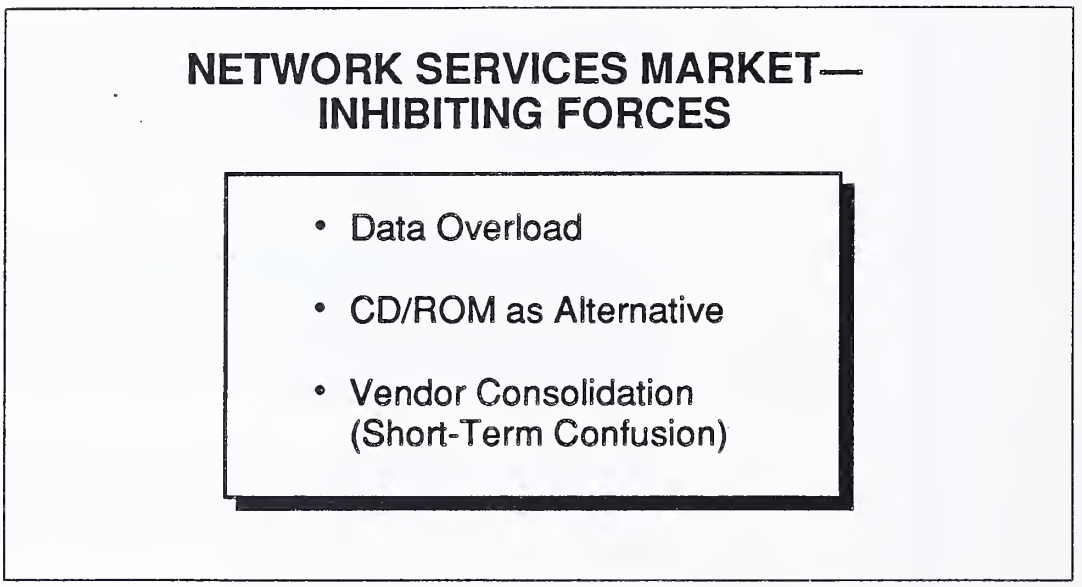
The global economic system is a significant contributor to network services growth. As more business transactions are internationally oriented, a network services capability to support these transactions and their underlying relationships, becomes more crucial.

Finally, the development of a global network communications infrastructure in the 1990s will itself stimulate demand for such capabilities. The capacity for rapid transmission of data, voice, and images across continents will emerge in the mid-1990s as a powerful impetus for person-to-person and business-to-business use of such facilities.

2. Inhibiting Forces

Despite such an optimistic outlook, there are some inhibiting forces, shown in Exhibit II-7.

EXHIBIT II-7



An unanswered question is whether the consumer/user may begin to suffer from "data overload." How much information can one user require and/or absorb? Will the 3,300 U.S.-based data bases overwhelm those who need information?

- With the increasing capability of Compact Disks/Read-Only Memory devices (CD/ROMs) an alternative data base delivery mode appears, threatening the position of on-line data base vendors. Large data bases can be placed on a CD/ROM disk and shipped directly to any PC user with a CD/ROM drive. This could inhibit data base services growth, as users gravitate to this convenient form of data access. Cost trade-offs are still a limitation to CD/ROM usage, but costs are falling.

In fact, several data base vendors now are experimenting with CD/ROM delivery to their clients as a defensive strategy to protect their client base, and as an offensive strategy to attract new clients.

Vendor consolidation is likely; development and maintenance of large data bases is labor-intensive and economies of scale are important. The

acquisition of Dialog from Lockheed by Knight-Ridder, and the possible CSC/Equifax credit data base combination, are examples of this trend.

3. Leading Vendors

The leading vendors in the network services market are shown in Exhibit II-8. The concentration within the network services market is reflected by the fact that 13 vendors generate 56% of the industry total. Entrenched vendors seem likely to retain their positions, barring acquisition.

Leaders in this market are primarily data base vendors. Equifax, TRW, Quotron, McGraw-Hill, and Mead Data Central all derive the majority of their revenues from data base services.

EXHIBIT II-8

LEADING VENDORS REVENUES AND MARKET SHARES NETWORK SERVICES MARKET, 1987

Company Name	1987 Revenue ($ Millions)	Market Share (Percent)
Equifax, Inc.	505	10
TRW Information Services	340	6
Quotron Systems (Citicorp)	270	5
McGraw-Hill, Inc.	265	5
Mead Data General	225	5
CUC International, Inc.	200	4
McDonnell Douglas Information Systems Group	195	4
Telerate, Inc.	180	4
Sprint (& Telenet) Communication Corp.	170	4
Computer Sciences	170	4
MasterCard	150	3
Control Data Corporation	140	3
Knight-Ridder/Dialog	120	2
Leading Vendor Total	2,930	60 *

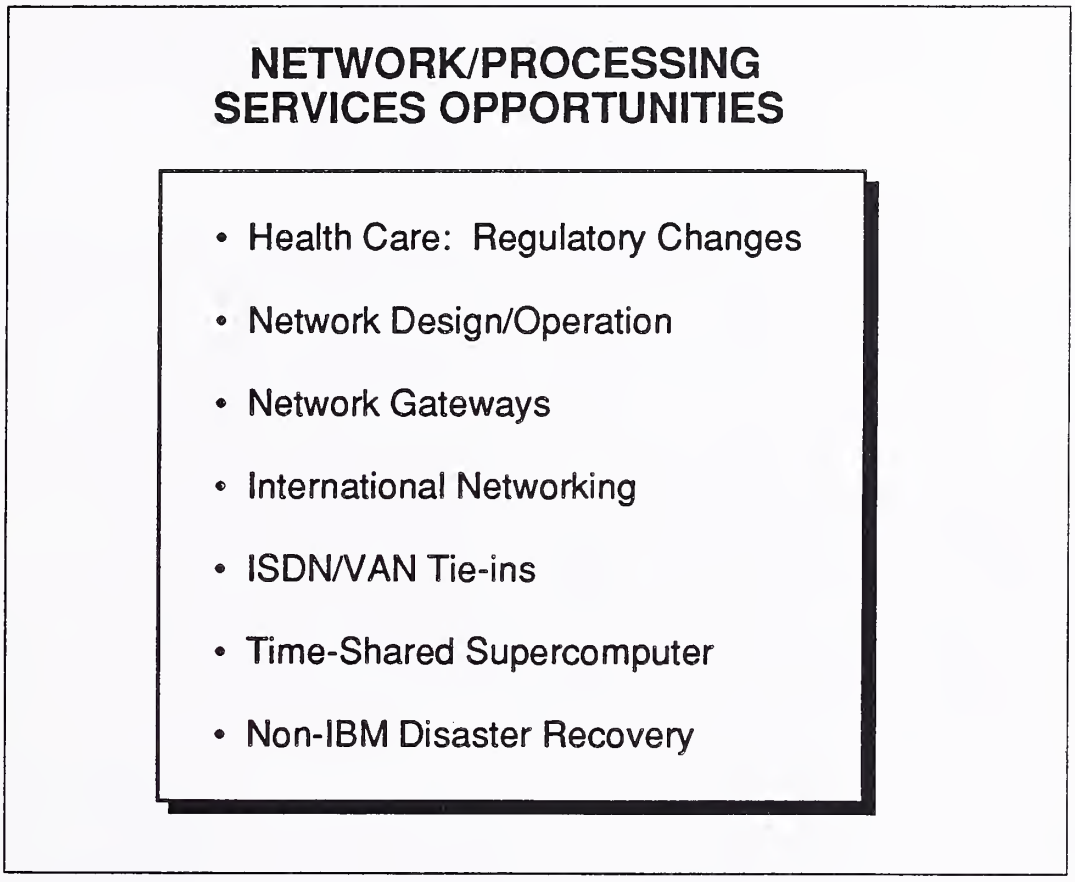
*1% Variance due to rounding.

D

Opportunities and Recommendations

The rapid growth of network services markets will provide ample opportunities for Information Services Vendors. Despite the relatively low growth (12%) of the processing services sector, specific niche-oriented opportunities also exist. These are discussed in detail in Chapter VI and are summarized as Exhibit II-9.

EXHIBIT II-9

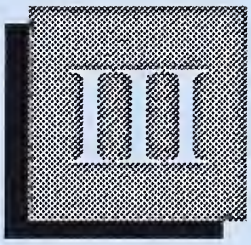


Vendors who are active in the processing or network services markets, or who are considering market entry, should consider INPUT's recommendations to vendors, also discussed in detail in Chapter VI (see Exhibit II-10).

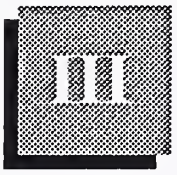
EXHIBIT II-10

RECOMMENDATIONS TO VENDORS

- Evaluate Role of New Technologies and Applications
- Expand to All Forms of Telecommunication Technology
  - Cellular
  - Fiber Optics
  - Satellites
- Determine How Transmitted Data Can Be Processed
- Develop Gateways to Emerging Communications Services
- Build Relationships with Vendors of Emerging Services
- Understand Technical Requirements for Communication Services
- Develop Strategic Alliances
- Utilize Other Delivery Modes
  - Software Packages
  - Turnkey Systems
  - Customization
  - Education
  - Consulting
  - Systems Integration
- Deliver Distributed Processing and Data Bases
- Seek Specific Market Niches
- Deliver Total Solutions



Issues, Trends, and Events



Issues, Trends, and Events

A
Processing Services

1. Overview

The processing services market, approaching $19 billion in 1988, is the largest of the individual delivery modes identified and tracked by INPUT in the information services industry. Originally combined with network services, processing services became a separate category in 1988.

Historically, processing services was the first delivery mode tracked by INPUT. Emerging in the 1960s and growing to prominence in the 1970s, the processing services sector has spawned a number of large and very successful services organizations. However, growth rates have slowed in recent years as this market matures, and INPUT now projects a relatively modest 12% growth rate for the next five years. However, it should be noted that this growth rate is still several times larger than the growth of the U.S. economy as a whole. This is a healthy market that has good revenue and profit potential for a number of current vendors.

The major trends in the processing services industry are shown in Exhibit III-1.

- The leading vendors have achieved strong positions in their selected markets. Companies like Automatic Data Processing, Electronic Data Systems, Control Data, McDonnell Douglas Information Services, and Computer Sciences have achieved significant shares of their revenues and profits from the processing services industry, while diversifying into other delivery areas as well.

- Although McDonnell Douglas encountered difficulty in 1987 and 1988 with layoffs, restructuring, and continued losses, other major vendors such as ADP and CSC report solid growth and profitability.

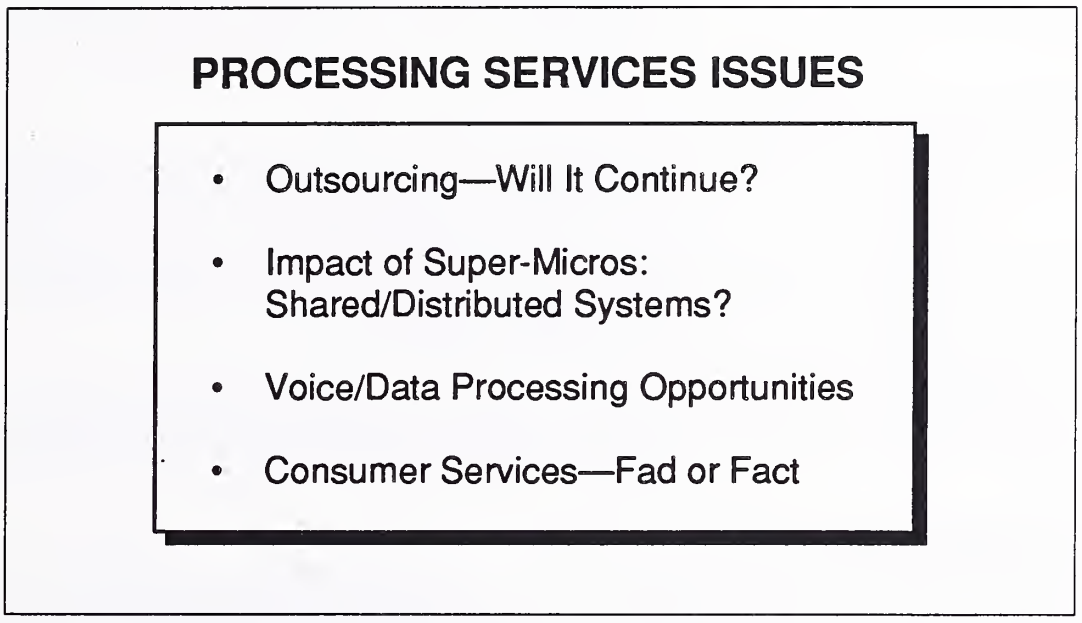
- As both an offensive and defensive strategy, vendors are offering their solutions to clients in an expanded delivery mix. Software products, turnkey systems, systems integration, and professional services are increasing the revenues and market positions of numerous companies.

- Large users of computer systems have moved into a vendor role by offering industry-specific and/or utility processing solutions to their suppliers, customers, or peers. Bechtel, McKesson, AMR (American Airlines), and a number of commercial banks have adopted this strategy.

EXHIBIT III-1

The continued growth of the processing services market depends on several factors, shown in Exhibit III-2. First is the trend toward outsourcing of data processing applications work. As long as large numbers of organizations are willing to off-load certain applications or processing requirements to third-party vendors, the market will remain viable. It is INPUT's conclusion that this trend will continue.

EXHIBIT III-2



- The proliferation of super-micros, powerful workstations, and minicomputers as departmental systems will complicate the ability of IS departments and processing services vendors to deliver integrated solutions across distributed systems and data bases. Though such complications may slow the growth of "conventional" processing services, vendors that can adapt to it will gain a market advantage.

- Technology will rapidly provide combined voice/data networks (i.e., ISDN) that will change the way data communications requirements are executed. This will introduce a barrier to "business as usual" remote processing, but it can also become an opportunity for innovation.

Finally, consumer-oriented services may provide a significant economic boon for network and processing vendors. The unknown factor is the degree to which the 15 million personal computers now installed in the U.S., and the millions more to be installed in the 1990s, will be used by consumers for personal services. INPUT is confident that innovative vendors will find ways to tap this huge potential market.

2. Transaction Processing

Transaction-oriented processing services constitute the dominant form of processing service delivery (81% of the revenues from this delivery mode). Vendors such as ADP, EDS, First Data Resources, Shared Medical Systems, and National Data Corporation derive a large share of their revenues from such activity. (Vendor activity is discussed in detail in the following chapter.) INPUT estimates that transaction processing will continue to be the primary revenue source in this market, and that it will grow at a compound annual growth rate of 11% over the next five years.

However, entry into the transaction processing segment will not be easy. The start-up cost of processing services operations is high, and prominent vendors are entrenched. New entrants would be well advised to clearly identify specific niche markets that are not currently dominated by a major vendor.

INPUT believes that customer requirements for information services can still be satisfied via the processing services channel, provided that specific needs can be met. Exhibit III-3 lists these needs.

EXHIBIT III-3

CUSTOMER REQUIREMENTS PROCESSING/NETWORK SERVICES

- Rapid Response to Changing Conditions
- Flexibility in Delivery Mechanisms
- Expanding Variety
- Customization
- Innovation
- Economy (within Context of These Factors)

Specifically, the more tailored, vertically oriented, and flexible solutions are the more likely to receive high levels of client acceptance, and are less vulnerable to replacement.

The transaction processing sector is characterized by the customer's willingness to off-load entire sets of applications, often those of a critical business nature. The willingness of user organizations to resist bringing these important applications on to their own in-house systems depends on the vendor's ability to perform such applications in a cost-effective and reliable manner. When the vendor can achieve this, there is strong inertia not to bring the application in-house.

3. Utility Processing

Utility processing is defined as the use of raw computing power and tools to develop tailored applications or solutions specific to users' personal requirements. Utility processing is primarily used in very large government engineering and manufacturing environments. The IS vendor provides access to the computer through a communications network, with software tools and consultive support to enable the user to develop and run the specific application being created. Software tools usually include compilers, DBMS, 4GLs, sorts, terminal hardware support, scientific and statistical libraries, graphics capabilities, financial modeling systems, and other application developments tools.

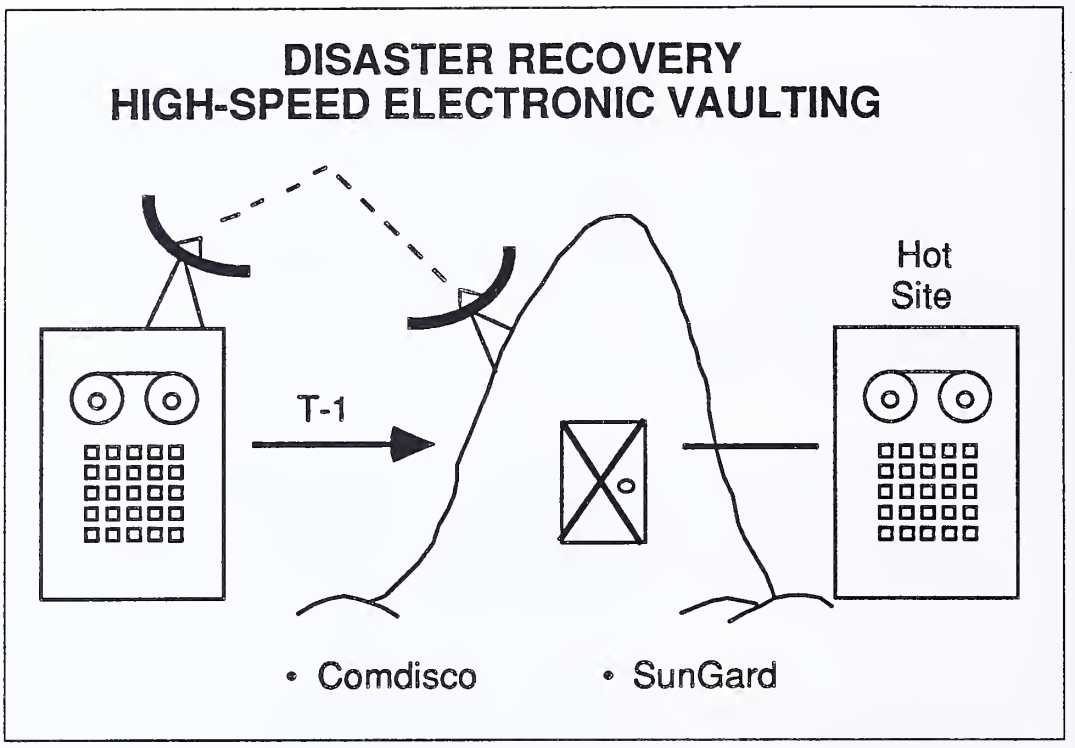
Limitations on PC processing power, memory, or disk capacity may cause end users to use utility services on an ad-hoc basis. However, the primary means of protecting revenue in this function is for astute vendors to be proactive and provide specialized software tools and consulting aids to encourage customers to use their utility processing services. Graphics, use of supercomputers, and internal IS overflow work can also contribute to revenue growth here.

Utility processing is not a business segment that vendors should casually enter at this time. It is primarily captive to existing vendors that have already invested capital in the computer hardware, communications network, and storage medium required to provide the service.

4. Other Processing

The "other" processing services include computer output microfilming, disaster recovery and backup services, carry-in data entry services, and off-shore data entry. This sector will be primarily fueled by the rapid growth of disaster recovery, keyed by several frightening experiences at Fortune 500 corporations (the First Interstate Bank fire in Los Angeles, for example) which made it clear that large organizations with mission-critical systems are vulnerable if they do not have such services in place. Comdisco and SunGard Data Systems have achieved strong positions in the market (see Exhibit III-4). Also, computer output microfilm services are established as a cost-effective way of storing large amounts of digitized information. Until CD/ROM or image processing disks with high

EXHIBIT III-4



densities become more prevalent, this will continue to be a reasonable growth market. Anacomp, through acquisition, and Zytron are leading vendors of COM services.

5. Systems Operations (Facilities Management)

Systems operations continues to be a market dominated by a few major vendors including: EDS, Systematics, SEI, Boeing Computer Services, Mellon Bank, Martin Marietta, Shared Medical Systems, and McDonnell Douglas. The investment required to enter this market is significant, and the skills to provide this service tend to be industry specific. Market growth will primarily be channeled in specific vertical markets that have already adopted the systems operations philosophy. Traditionally the banking and finance, insurance, medical, and state and local government sectors have been most receptive to this approach, due to the combination of massive amounts of paper generation and financial limitations in staffing with large numbers of qualified people. It is difficult for clients to disengage from a systems operations approach once it has committed, so contracts and relationships tend to be long term.

Forces driving the systems operations markets are: tight labor markets, which make retention of skilled technical staff difficult; difficulty in some sectors in paying competitive salaries for these skills; users' perceptions of the high cost of upgrading installed systems and the chance to pass the cost, at least indirectly, to a vendor; finally, the momentum provided by completion of complex systems integration projects which are candidates for systems operations contracts.

The primary trends in systems operations markets include:

- The inclusion of large network management contracts in the systems operation area, adding to the existing activity in information processing projects.
- Development of systems and applications, as well as actual operation. To some extent, this represents an overlap with systems integration markets.
- More contracts are being negotiated using a "shared resources" concept. That is, the vendor agrees to perform the work in data centers where numerous systems are linked together. The client may be unaware which machine or machines is performing the work, or even which location, but that is immaterial for the result.
- Vendors are beginning to mix equipment brands, using a variety of IBM, Digital, Amdahl, and Unisys systems based on specific needs. Previously, systems operations vendors have been IBM systems users almost exclusively.
- Vendors tend to be focused on one or two specific vertical markets where they have developed expertise, people skills, and reputations.
- Long-term contracts are more frequently negotiated, beyond a one-year term.
- Competition is high for the skilled personnel resources who can perform in a systems operations environment. In competitive bidding, losers will frequently attempt to recruit key players from the winner's staff, to hamper the winner's ability to perform.

B
Network Services

1. Overview

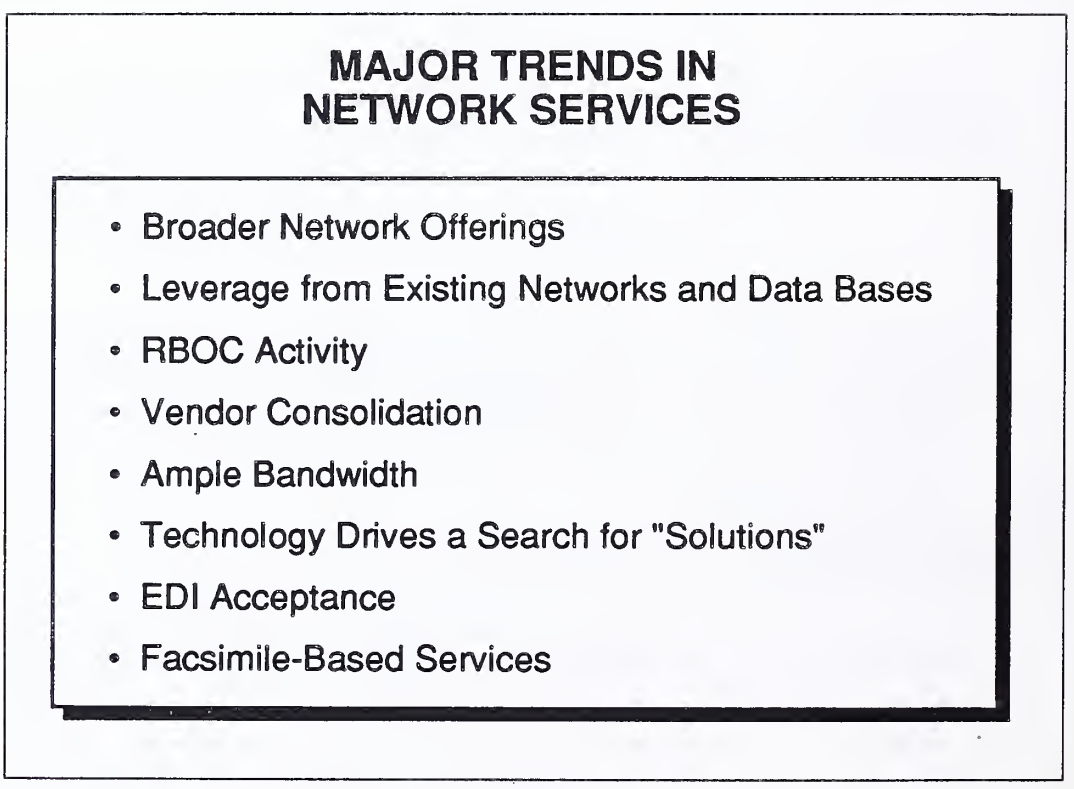
The network services markets (there are several; see Exhibit I-1) are characterized by optimistic outlooks from many vendors. Enthusiasm for the future of the industry, and about individual vendor growth rates, is running high.

The major trends for the network services market are summarized in Exhibit III-5. They include the following:

- Vendors are moving to provide a broad, more flexible range of services, and leverage their network capabilities, or data bases, through such services.

- Regional Bell Operating Companies (RBOCs) and Bell Operating Companies (BOCs) are moving into this sector, and their presence will change the industry over time, and enhance its growth (See Section III-D of this report.)
- Vendor consolidation is occurring here as well as in other IS delivery modes. Knight-Ridder/Dialog and U.S. Sprint/Telenet mergers are examples of this trend.
- The acceptance of EDI is fueling the growth of value-added services and providing related opportunities in professional services and software products.
- Ample bandwidth will be available for future services, due to the increased use and capacity of fiber optics networks.
- Technology is creating significant "enablers" to provide solutions not yet developed.

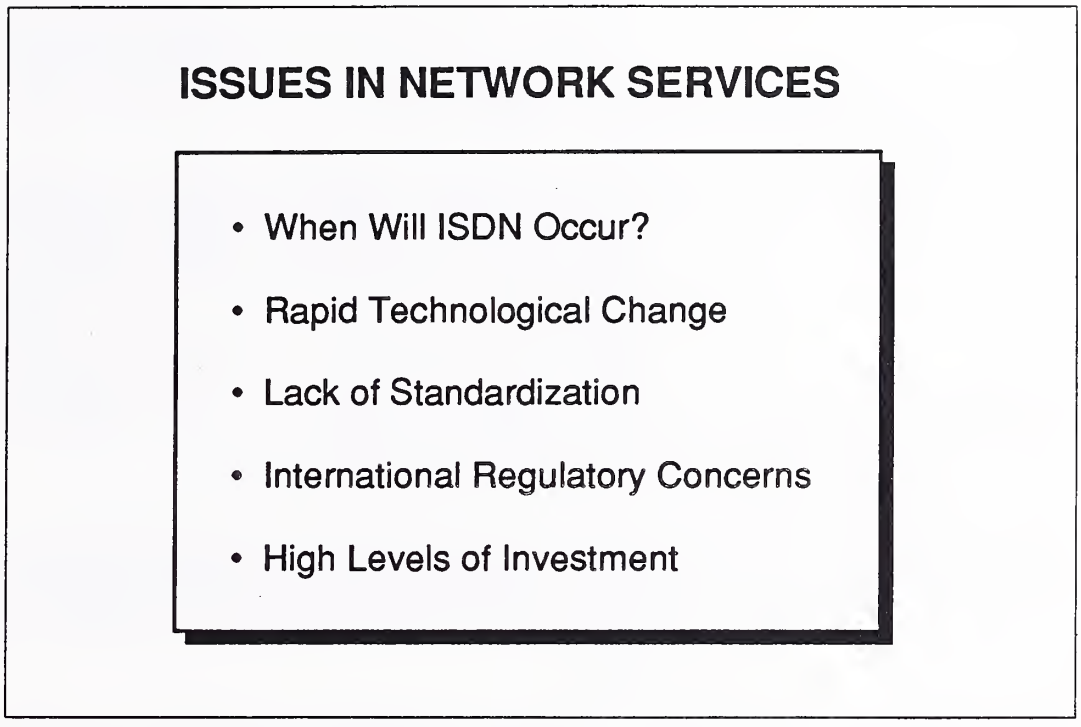
EXHIBIT III-5



There are key issues concerning network services that are unresolved today (see Exhibit III-6). First, the implementation of ISDN seems certain, but the timing and exact content of the service are still unclear.

The rapid technological change in the industry will require considerable investment by network services vendors to maintain a unique service. The current lack of standardization will increase the uncertainty in this

EXHIBIT III-6



effort, as vendors risk obsolescence after investing large sums in development and implementation of new communications technologies.

The regulatory issues are unclear, in the U.S. and internationally. The removal of European trade barriers in 1992, for example, could make it easier for European firms to expand their local markets, while a "protectionist" approach keeps U.S. firms from further entry.

2. Value-Added Networks

The Value-Added Networks (VANs) have provided classical message store-and-forward and packet switching capabilities. Vendors such as McDonnell Douglas Tymshare, Telenet, and IBM Information Network achieved significant growth through the provision of such "backbone" capabilities. However, the arrival of RBOC-sponsored Integrated Service Data Networks (ISDN) in the early to mid-1990s, could complicate VAN strategies while offering leverage for new VAN services that utilize or interface with ISDN.

3. Electronic Data Interchange (EDI)

EDI is the application-to-application exchange of data representing business documents between companies in an agreed format or standard. The most widely used formats conform to the American National Standards Institute's X12 standard.

Translations between the user's internal data formats as created by (for example) a purchasing system and a standard is generally accomplished by translation software, but it can be done by a third-party service provider.

Most of the major network service companies are now providing EDI services. EDI has taken on a certain aura in the user community. Although there is skepticism in some quarters, INPUT has observed several vendors experiencing extremely high growth rates. Though this might be expected in a new area, it also represents broad acceptance of EDI as "a new way of doing business." The primary reason for this growth is that EDI addresses fundamental aspects of doing business: buying and selling, and the movement of goods.

INPUT's research shows that more than half of the surveyed large companies, educational institutions, and state governments are now using, or actively planning and implementing, EDI. Over 40 industries are involved.

In addition to purchasing and logistics related activities, EDI is also being used in Electronic Medical Claims (EMC) applications. This area will likely see growth as a result of the recently passed Medicare Catastrophic Health Care Act.

EDI is also used for agent-insurance company interfacing, and in some other areas. Several federal agencies are implementing EDI with implications for government contractors and opportunities for service providers.

The major third-party EDI providers are:

- General Electric Information Services Co. (GEISCO)
- Sterling Software's Ordernet Division (SSW)
- McDonnell Douglas Applied Communications (MDC)
- Kleinschmidt Inc.
- IBM Information Network
- Control Data Corporation (CDC)

Recent market entrants are CompuServe and Western Union. AT&T recently reentered the market with an offering associated with its electronic mail. ADP and National Data Corporation have signaled intentions to enter the market. Additionally, several second-tier processing firms participate, typically within market niches such as rail or truck transportation. These include Railinc (a subsidiary of the American Rail Road Association) and TranSettlements (a subsidiary of Transus, a trucking firm). Industry associations also manage EDI clearinghouses, the best example being Transnet, operated by a unit of the Motor Equipment Manufacturer's Association.

a. The Market

INPUT projects that user expenditures for EDI network services *alone* will grow from $200 million in 1988 to over $1.7 billion by 1993, representing an compound annual growth rate (CAGR) of nearly 56%. This forecast includes the electronic medical claims and batch insurance interface varieties of EDI, and Federal EDI.

The high rate of growth is due to several key factors:

- EDI addresses fundamental business functions. For users, it ultimately means lower costs through reduction in manual procedures, improved productivity through reduced inventory, enhanced management reporting through application integration, fewer errors from rekeying information, improved customer service due to improved information, and faster turnaround due to less reliance on mail for delivery of business documents.

- In many instances, large companies are requiring their trading partners to adopt EDI as a condition of continued business. In some cases, discounts are offered to EDI users. This is called "the domino effect."

- The nature of traditional business transactions does not stop with the exchange of a purchase order and an invoice. There may be 12 or more documents exchanged between trading partners, such as requests for quotations, change notices, shipping notices, and others. Additionally involved are agents such as transportation carriers, banks, insurers, brokers, and the like. This multiplicity of transactions is called "the cascade effect."

Also contributing to high growth is increasing awareness that EDI is available, and the fact that it has been proven as a productivity tool with little on the "downside" to prevent implementation.

b. Significant Trends and Events

In 1987-1988, the following events and trends are having a bearing on the marketplace. See Exhibit III-7.

- The continued market domination by GEISCO. It has been the most aggressive player, with alliances with vertical market software companies and an increasing international presence. The company had taken a broad attack on the market, but is now narrowing its market development focus on several areas: retail, aerospace, automaking, heavy equipment, petrochemicals, banking, trade, and transportation.

EXHIBIT III-7

TRENDS IN EDI

- Trading Partners Increasing, Acceptance Growing
- Active Planning of EDI
- Business Advantage Is Provided
- Vendors Seek Leverage and Uniqueness with EDI
- Electronic Medical Claims: a Growing Business
- GEISCO Continues to Dominate
- Increasing Willingness to Internetwork
- Low-End Services Emerging
- Bank, RBOC Entry Foreseen
- International Acceptance

- Increasing willingness by third-party services to internetwork—that is, pass EDI data between services without double charging. This obviates users' needs to maintain multiple accounts and equipment settings in order to trade with partners using various services. More importantly, it facilitates usage and will likely lead to increased traffic on all networks.

- The emergence of low-end services featuring low network service pricing and inexpensive, bundled PC software. Harbinger Computer Systems (Atlanta, GA) is a new example of this approach; Control Data is an earlier example.

- The development and testing of EDIFACT (EDI For Administration, Commerce, and Transportation) by several multinational corporations.

- The introduction of EDI in many trading nations: Australia, New Zealand, Hong Kong, and Singapore. Japan's trade ministry has formed an industry committee to develop EDI.

Trends foreseen in the near future include:

- Service offerings by one or several of the Regional Bell Operating Companies (RBOCs) as gateway providers and billing agents for EDI services, and possibly as service providers in their own right.

- Increasing participation by banks that have been slow to identify their appropriate role as EDI/EFT agents for transferring value as well as related information.

- Enhancements to EDI services with graphics capabilities for industries requiring visual product specifications and CAD/CAM images as part of purchasing documents.

- Acquisition of faltering participants and secondary players by the leading companies attempting to gather market share.

c. Opportunities and Recommendations

INPUT believes EDI is a key market opportunity for network service companies and recommends that such firms evaluate ways of participating in the market.

The service companies without EDI should consider various approaches to offering such services as a means of preventing churn, the turnover of current customers signing with competitive firms that do offer EDI.

However, INPUT recommends caution in EDI technical development and marketing. Many firms should consider remarketing agreements and other forms of joint ventures as a ways of gaining market entry, particularly if they are currently serving markets with applications that may be enhanced through EDI functionality.

Key opportunity areas are differentiated services such as those providing relevant data bases supporting EDI functions (i.e., product catalogues from a variety of suppliers), graphics support for industries requiring visuals as part of a purchasing and specification document (such as aerospace and electronics), and services-supporting links between financial services and/or insurance applications and EDI purchasing-related functions.

Additionally, several vertical markets remain to be introduced to EDI and developed. These include (but are not limited to) state and local government procurement and purchasing, process manufacturing, hotel supply, fresh foods, speciality retail distribution, and advertising.

Additional information about the EDI market can be found in a series of continuing reports and newsletters produced by INPUT's EDI Planning Service.

4. Electronic Mail

Electronic mail has primarily been implemented in an intraorganizational fashion using in-house computers to control the flow of traffic. A small market has developed for electronic mail services, involving the sending of such messages over a value-added network managed by an information services vendor. This is a relatively slow growth market at 11%, one that may be primarily absorbed in the future by ISDN networks and functionality, as well as facsimile mail and other forms of image-oriented transmissions.

5. On-Line Data Bases

On-line data base vendors are positioned to take advantage of the consequences of an exploding PC population and the increasing demand for information from consumers and businesses. Needs in business for rapidly available information obtained by electronic means will continue to fuel the growth of this market. Exhibit III-8 summarizes major trends in this sector.

EXHIBIT III-8

TRENDS IN ON-LINE DATA BASES

- Small Number of Vendors
- Consolidation
- Information Overload a Possibility
- Vendors Striving for Differentiation
  - Common Interface
  - Ease of Access

The market is characterized by a small number of data base vendors, approximately 300, in contrast to much larger populations in other industry sectors. Even so, there are too many OLDBS vendors offering the same services and capabilities. A consolidation will occur, and has already begun with Knight-Ridder's acquisition of Dialog from Lockheed. Continuing profit pressure on the smaller-sized data base vendors may accelerate the trend toward consolidation. For the larger vendors, economies of scale do exist—revenues per employee are higher than in any other delivery mode tracked by INPUT.

The current growth momentum in electronic information services is reflected in the fact that information publishing, in particular, has become a hot takeover market. It is the large data bases and existing on-line delivery (or the potential for transforming them into electronic data services), that is creating much of the takeover interest in Macmillan and has lead in recent years to the takeover of Prentice-Hall, Addison-Wesley Publishing Co., Grolier, and I.M.S. International (a pharmaceutical market research company). McGraw-Hill, which is the last remaining major independent publishing company, has also been subject to recent takeover interest. This interest has created very high sale values in recent acquisitions. Value of two or three times annual revenues have been paid in some buy-outs.

The market is becoming more crowded in terms of available information. There are at least 3,300 electronic data bases produced by some 1,480 information purveyors. These companies collect, analyze, consolidate, and scrub the data, and then offer it to information vendors who resell it in electronic form. Such vendors include leading players such as Equifax, TRW, McGraw-Hill, Telerate, and others. Use of data base information is particularly strong in areas where immediate financial information aids decision making: securities quotations, credit authorization, check verification, etc.

Distributors of larger data bases have concentrated on providing common user interfaces. This concentration allows data base information users to conveniently access multiple data bases from multiple purveyors. This is a significant improvement from previous procedures where each data base had its own common language and interface, a situation that presented great difficulties for casual users.

Another reason for a shakeout in this industry is the overlapping number of vendors providing identical information. There is no economic need for more than a handful of vendors offering specific data. For example, there is little to differentiate stock quotation data among vendors. Price and user interface and support issues therefore become important in differentiating competitors. Vendors will want to have more product (a large number of data bases) and improved user interface systems to

attract users. Certainly the facilities provided by improved graphical user interfaces, such as Apple's Macintosh and IBM's Presentation Manager, will give vendors that offer them an advantage in this marketplace.

6. News Data Bases

As the availability of information becomes more important for competitive advantage, rapid response, and tactical planning, electronic news data bases will continue their rapid growth. Companies that create news data bases—such as AP, Reuters, and Dow Jones—are offering these in electronic form for rapid, convenient delivery and access, and to gain improved market positions.

7. Cross-Industry Data Bases

Cross-industry data bases represent about 50% of the available market today, covering such widely used applications as securities quotations, personal or business credit checking, and check approval. These applications have previously been categorized by INPUT as industry-specific (related to financial institutions), but are now considered cross-industry because there is virtually no limit on the kinds of business or personal users who might require this information.

8. Videotex (Other Network Services)

The market for videotex services has yet to materialize. There are a number of organizations and joint ventures that are looking for participation, but this is still an embryonic market. Home subscribers to videotex services probably do not exceed 1,000,000. A number of well-known firms provide videotex, including Compuserve, Dow Jones New Retrieval, Source Teleoperating, and Genie. Most commonly used applications are in banking and finance. Business videotex appears to be growing more rapidly than consumer videotex. In the services base area there are a number of applications currently being evaluated or tested.

Computer Sciences has announced plans to introduce a new videotex-based service in 1989. CSC's Infonet and Minitel USA have formed a joint venture, Minitel Services Company (MSC), which expects large numbers of entrepreneurial information and entertainment service providers to bring videotex to computer owners in North America. MSC services will be available to PC users through local Infonet dial-up lines in 150 cities.

BellSouth and other RBOCS have also begun to experiment with videotex, as this has obvious applicability and potential for their network-based delivery capabilities. The entry of such large firms could provide momentum to the marketplace.

Newspaper chains have invested millions of dollars trying to enter this market. Knight Ridder in Florida and Times Mirror in Los Angeles have been two well-publicized entries that failed to achieve any success. IBM, CBS, and Sears have formed Trintex to deliver videotex applications. Nynex, GE, and Citicorp similarly have a joint operation.

The concept and technology of videotex have been around for a decade, but the expectation of appreciable revenue has not been realized in the United States. Significant success has been observed in France, primarily because the French government literally gave away the computer terminals for its Minitel network, and information services such as the phone directory were no longer duplicated with traditional printed methods. This was a very successful tactic in France: some 4,400 service providers now meet the needs of more than 2.5 million users.

However, government intervention on this sale in the U.S. is unlikely. At this point, despite its bright promise, videotex services in the U.S. are still an unfilled technology. It is possible that in the 1990s this potential finally will be realized.

C

Public Process Services Company—Revenue and Net Income Performance

In 1987, INPUT separated the public processing/network services market into two categories (processing services and electronic information services). The following companies, with an average growth rate in 1986 of 31%, were transferred in 1987 to the new category of electronic information services companies: CCX Network, Epsilon, Information Resources, LCS Industries, and Telerate. Since the average growth rate in 1986 for the combined category of public processing/network services was 19%, the transfer of the network services companies had a dampening impact on the growth rate of the processing services group in 1987.

In addition, Anacomp was removed from the 1987 list of public processing services vendors due to its acquisition of Datagraphix, which changed Anacomp's primary business. First Data Management was also removed due to its acquisition by First Financial Management. In addition, FIserv and ISI Systems were added to the list.

At 1987 year-end, the public processing services sector demonstrated a 15% average annual growth rate. In 1986, the average annual growth rate was 16%. These figures reflect a continuing relatively steady growth pattern in revenues for this group.

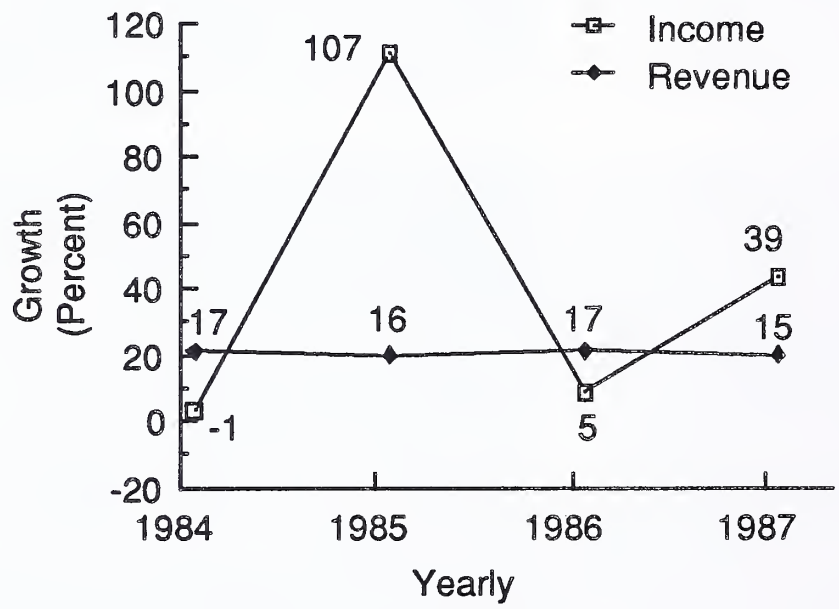
The average net income for the public processing services group (excluding the electronic information services vendors), showed a modest increase of 5% in 1986. In 1987, however, the net income of the public processing network service companies expanded at a 39% average annual rate. These figures reflect a continuing pattern of sporadic earnings in this group, which stems in part from continuing shifts in technology and from hot vertical markets.

Profitability for the processing services group in 1987 was approximately 9%.

For a historical perspective on the revenue and net income performance of the public processing services vendors, see Exhibit III-9.

EXHIBIT III-9

PUBLIC PROCESSING/NETWORK SERVICES VENDOR PERFORMANCE, 1984-1987

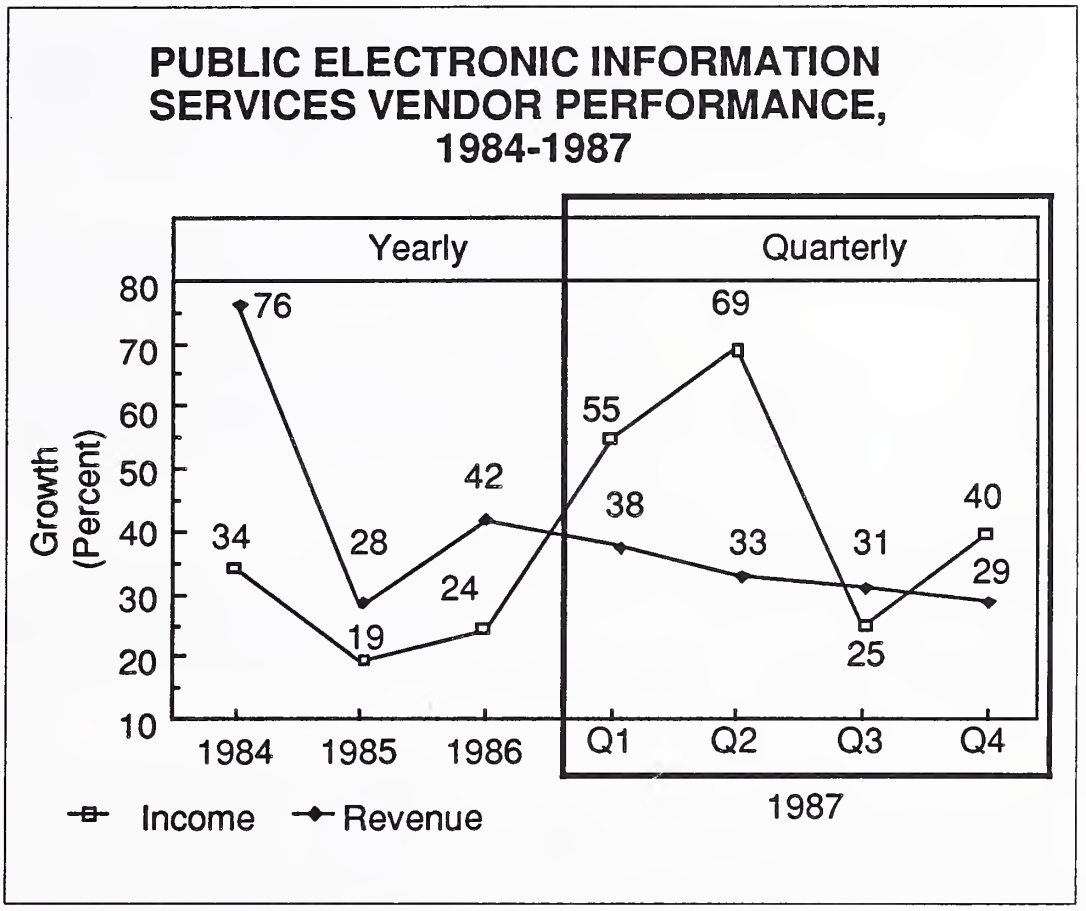


In 1987 the aforementioned five public companies previously in INPUT's processing services delivery mode were transferred to the new electronic information services group.

In 1987, the revenues of the public electronic information services companies increased at an average annual rate of 32%, whereas net income improved by 45%. See Exhibit III-10 for details.

With the exception of the value-added network services, growth in the other major electronic delivery modes was strong across all the other major segments.

EXHIBIT III-10



D

Regional Bell Operating Company (RBOCs) Activities

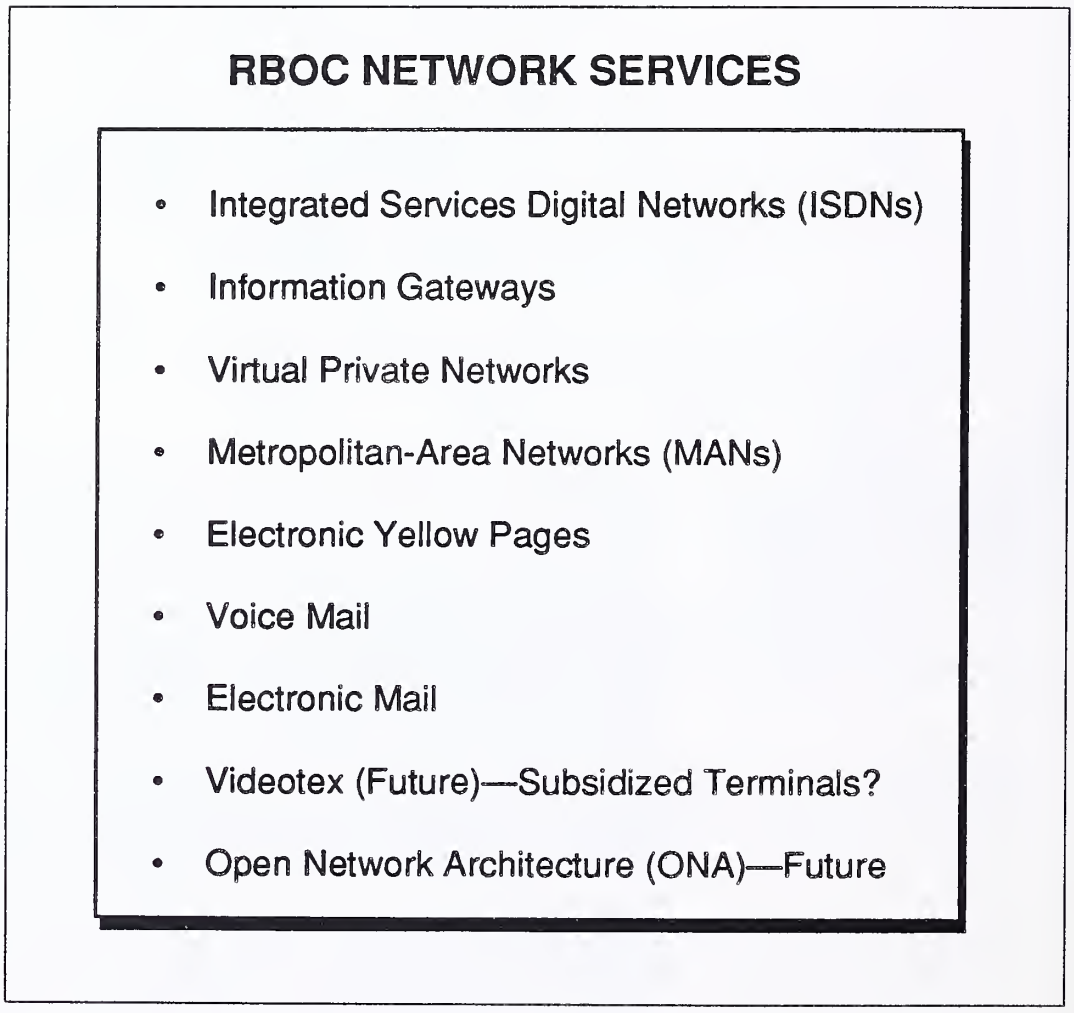
The RBOCs, created four years ago by the break-up of AT&T, are cash-rich organizations with a strong desire to enter the information services, computer hardware, and maintenance markets. Judge Greene's Modified Final Judgement has continued to limit the RBOCs ability to directly enter the information services market with telecommunications products. RBOCs are allowed to offer the transmission facilities and gateways for videotex, electronic mail, and on-line data base applications, but the direct creation and provision of such data bases is expressly prohibited. Additionally, RBOCs are able to engage in unregulated activity with software companies, computer equipment, and computer maintenance and support services. The most noteable example of RBOC activity in this area was the acquisition of Applied Data Research (ADR) by Ameritech in late 1985. It appears that the synergy between Ameritech and ADR never developed as expected: Ameritech recently sold ADR to Computer Associates International for $170 million, about $60 million less than the purchase price paid in 1985. Computer Associates has moved swiftly to establish the synergy between itself and ADR.

Two other RBOCs have made acquisitions that move them into professional services. Cincinnati Bell recently acquired Vanguard Technologies, a professional services firm with strong presence in the federal

government marketplace. More recently NYNEX acquired AGS, one of the larger professional services firms with strong presence in both federal and commercial marketplaces. This acquisition could enable NYNEX to be a more aggressive systems integrator in the future.

The major thrusts of new products and services for the RBOCs in the future are expected to be in their more natural domains, those of the processing and network services delivery modes. Exhibit III-11 outlines a range of RBOC services that are either currently offered or applied for with regulatory agencies. INPUT anticipates that some or all of these services will soon become products aggressively marketed by a number of RBOCs. The unknown factor, of course, is the regulatory approval cycle.

EXHIBIT III-11



Of particular interest is the Integrated Services Digital Network (ISDN), which all of the RBOCs plan to offer in the near future. When fully implemented, these provide enhancement opportunities to the value-added networks currently offered by network services vendors.

Information gateways are a logical step in leveraging RBOC in-place networks to access the wide variety of data bases and information services now available.

Metropolitan-area networks (MANs) are seen as an innovative way to tie together physically separated local area networks (LANs) within a single local access tariff area (LATA) served by an RBOC. Products such as videotex and electronic yellow pages, although still not generally accepted by the public, remain potentially attractive. Finally, the concept of the open network architecture (ONA), now being mentioned by RBOCs and filed with regulatory bodies in a few cases, offers a creative way for RBOCs to effectively unbundle the current spectrum of network services offered, and market them in a more cost-effective and convenient manner.

Finally the presence of AT&T in the computer systems business should not be overlooked. AT&T has had difficulty in gaining a foothold with its 3B minicomputer systems, but its recent major win with an Air Force procurement contract could change its market position. The Air Force could install as many as 20,000 AT&T minicomputers over the next few years. This is not a guaranteed contract, but one that, if fully exercised, could lead to that level of placements. Success with such a contract could make a major difference in AT&T's future in the minicomputer business. (Of course this business is already being squeezed through fierce competition and inroads from PCs and workstations at the low end.) As AT&T's computer business grows, information services may follow.

There are impediments to the profitable marketing of the RBOCs' unregulated services and products. Exhibit III-12 lists the more important of these factors. Central to RBOC limitations is continuing regulatory control from state and federal agencies. A longer-term inhibitor could be the corporate culture inherited from the old AT&T, which was not sales and marketing oriented. Change requires a major transition that may be more difficult for the RBOCs than was initially anticipated. Still, the RBOCs' in-plant equipment, backbone networks, cash, and large personnel pools make them potentially formidable competitors in any market they choose to address.

EXHIBIT III-12

RBOC SERVICE INHIBITORS

- Regulatory Controls
- Varying Local/Regional Services Make National Customer Network Usage Difficult
- Gateways Limited to LATAs
- Corporate Culture
- RBOC Sales/Marketing

E

Expanding Service Delivery Modes

In all elements of the information services industry, vendors have found that they must expand the scope and delivery of their services to remain competitive. The processing and network services markets are no exception. Aggressive vendors that have expanded in this fashion include:

- ADP, which is offering turnkey systems products for brokerage services and auto retailers, as well as its traditional batch-oriented payroll services
- Electronic Data Systems, which has expanded from its traditional facilities management base into turnkey systems and professional services
- McDonnell Douglas, which has developed turnkey systems and software products in the medical and manufacturing markets
- Computer Sciences, which has leveraged its Infonet network and timesharing origins into a major position in professional services and systems integration
- GEISCO, which has entered into VAR relationships for the sale of its network services
- NYNEX and Cincinnati Bell, who have moved into professional services through significant acquisition of AGS and Vanguard Technology, respectively

INPUT believes that vendors' expansion of delivery modes and solutions within the information services business must continue. This expansion is crucial for the continued growth of firms that now find themselves occupying a narrow niche in the processing/network services market.

F

Vertical Market Activity

The banking and finance sector remains the dominant vertical market in terms of processing services expenditures. From more than $3 billion in 1987 (nearly 20% of the processing services industry total), banking and finance revenues will grow at least 14% per year in the forecast period. See the following chapter for more details.

The transportation market has achieved strong growth, based on the use of airline reservations systems from a host of smaller airlines, that pay an average of $.85 per reservation. Transportation processing services expenditures are in excess of $1.3 billion. Primary revenue recipients, in INPUT's estimation, are: AMR (American Airlines), $495 million; United Airlines (Covia), $325 million; Texas Air (System I), $210 million; Eastern (PARS), $160 million; and Delta, $140 million. (United recently sold a portion of its system to a consortium of other airlines; this revenue will become captive in the future.)

The medical industry has reached the billion-dollar plateau with the strong use of processing services by hospitals of all sizes, led by products from Shared Medical Systems and McDonnell Douglas. As an example of an expanding variety of services and delivery modes, see Exhibit III-13, which shows the Shared Medical Systems approach.

G

Cross-Industry Markets

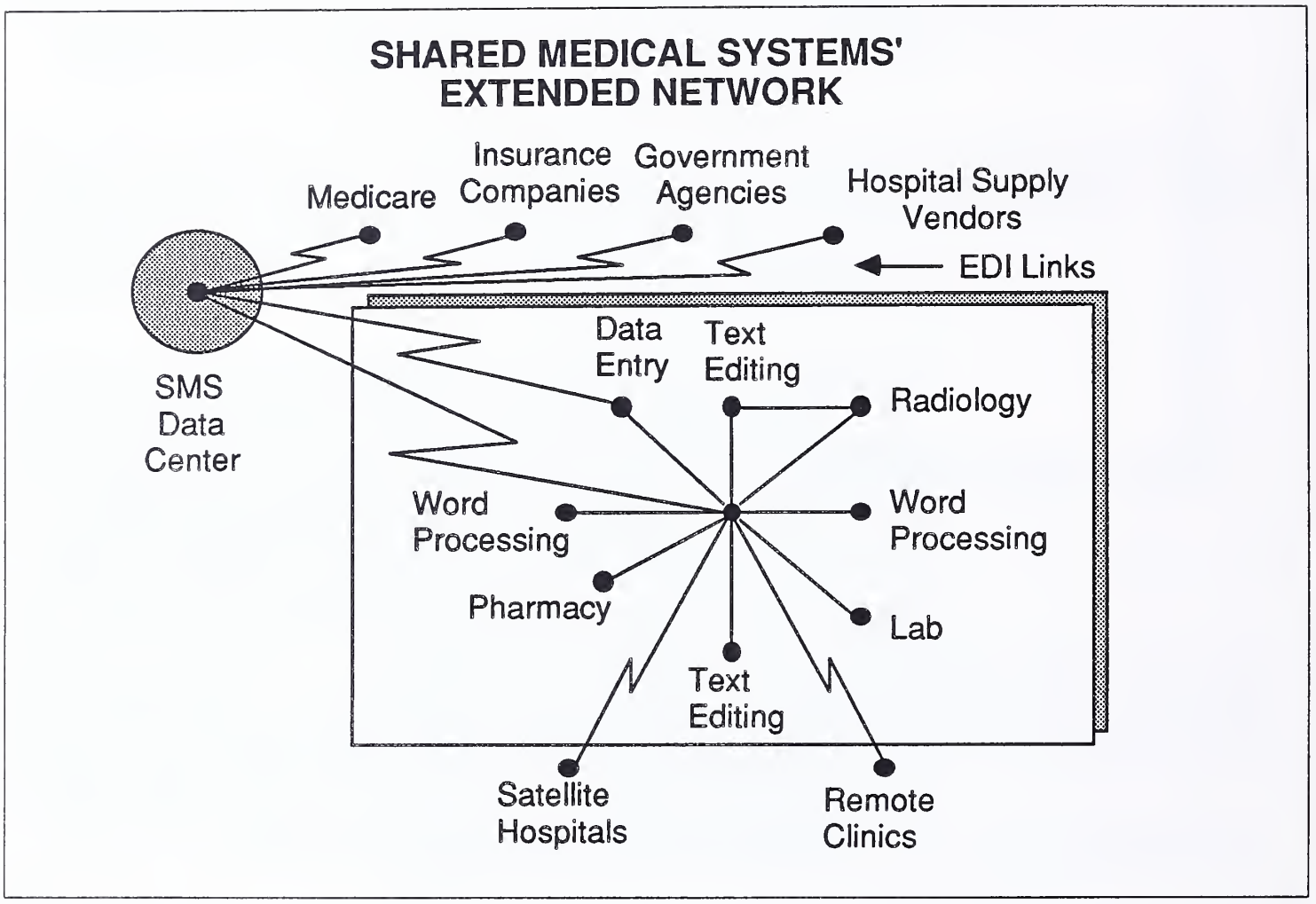
Cross-industry applications are strong in the processing services sector as well.

- Nearly $1.2 billion is generated from payroll, personnel, and other human-resources-related applications. Market leaders in this area are ADP, Paychex, and Bank of America.

- Accounting systems are also nearly a billion-dollar market. These include primarily the accounts payable, accounts receivable, general ledger, and financial accounting applications required in all businesses.

In the network services sector, federal government activity in the use of electronic mail and value-added networks places it high on the spending list. Process manufacturing spending is in excess of half a billion dollars, led by IMS, which offers pharmaceutical data bases to companies in the drug industry. Also prominent in network services is the use of cross-industry products, such as on-line securities quotation systems, retail credit and business credit rating and approval systems, and check authorization systems.

EXHIBIT III-13



H

Mergers and Acquisitions

In all segments of the information services industry, as well as among equipment manufacturers, mergers and acquisitions are running at a near-record pace. The Broadview Associates index, which tracks mergers and acquisitions in the industry, states that there were 358 such mergers in calendar 1987, at a value of $4.9 billion. 1988 saw 434 transactions worth $8.4 billion. Obviously this trend shows no signs of abating.

The reasons for such activity are many:

- The increasingly competitive nature of the industry makes it harder for small- and medium-sized firms to survive and deliver the quality products users desire. Consolidation is often the only way for smaller vendors to remain viable.

- Entrepreneurs who have founded many of the faster-growing companies in the industry are increasingly ready to reap their profits by selling to a larger vendor, especially in a difficult climate for taking small companies public.

- Companies are aggressively seeking partners to expand the scope and quality of their services and are willing to pay premium prices for acquisitions to achieve this goal.

- Vendors have realized that they are in a stronger competitive position when they can provide a complete range of services within their selected market niches. It is often more cost effective to buy this expanded presence than to develop it internally; significant time and resources are required to build from within.

Exhibit III-14 lists some of the more prominent mergers and acquisitions that have taken place during 1988 in the processing and network services marketplace. INPUT expects no decrease in this activity in 1989. Certainly a consolidation, or at least a concentration at the top of the vendor hierarchy, will continue. Today, the ten largest vendors in the combined processing/network services industries generate 20% of the industry revenues. During the market forecast period, INPUT expects this percentage to rise as consolidation continues.

EXHIBIT III-14

MERGERS AND ACQUISITIONS IN PROCESSING AND NETWORK SERVICES

- EDS/MTech
- Knight-Ridder/Dialog
- Unisys/Timeplex
- Cincinnati Bell/Vanguard
- NYNEX/AGS
- CUC International/Certified Collateral
- Cycare/American Physician Services (Databill)
- First Financial Management/First Data Corp.
- CSC/Equifax
  - Current Joint Venture, Possible Future Acquisition of Credit Data Base Operations

Market Forecasts, 1988-1993

IV

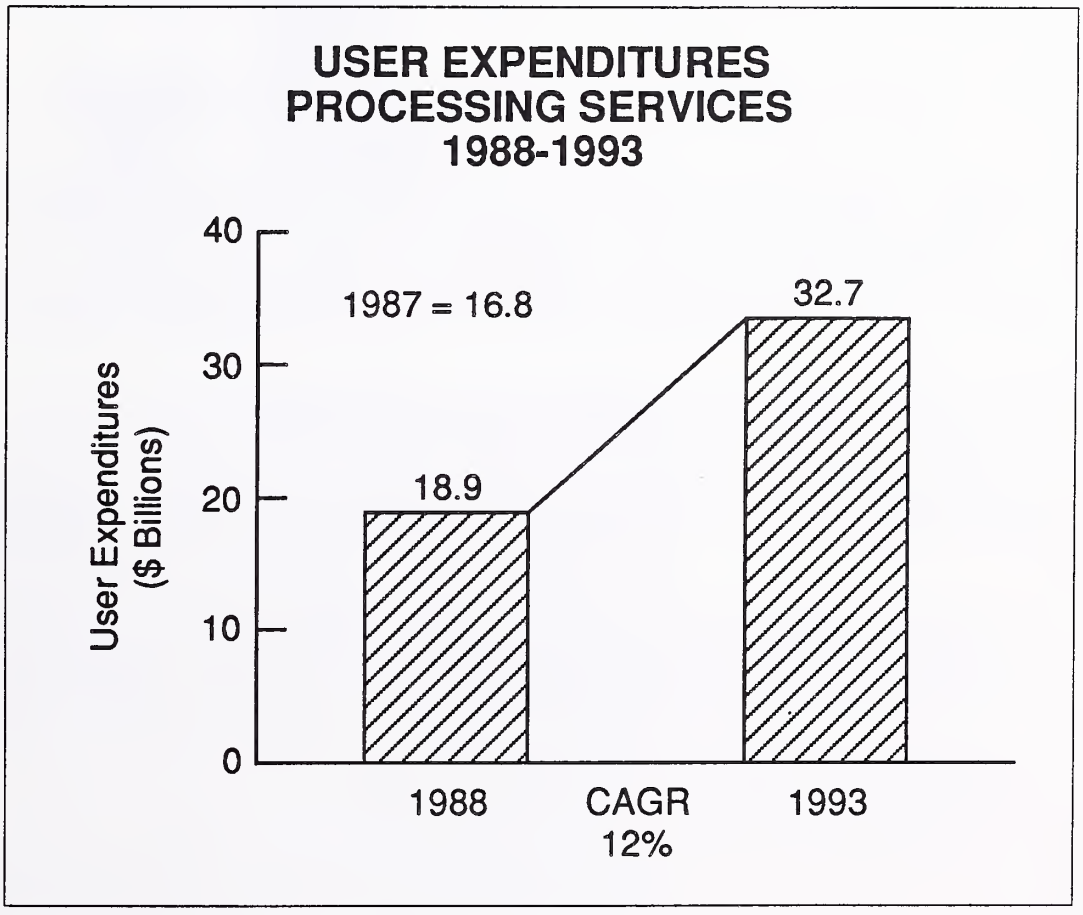
Market Forecasts, 1988-1993

A

Processing Services

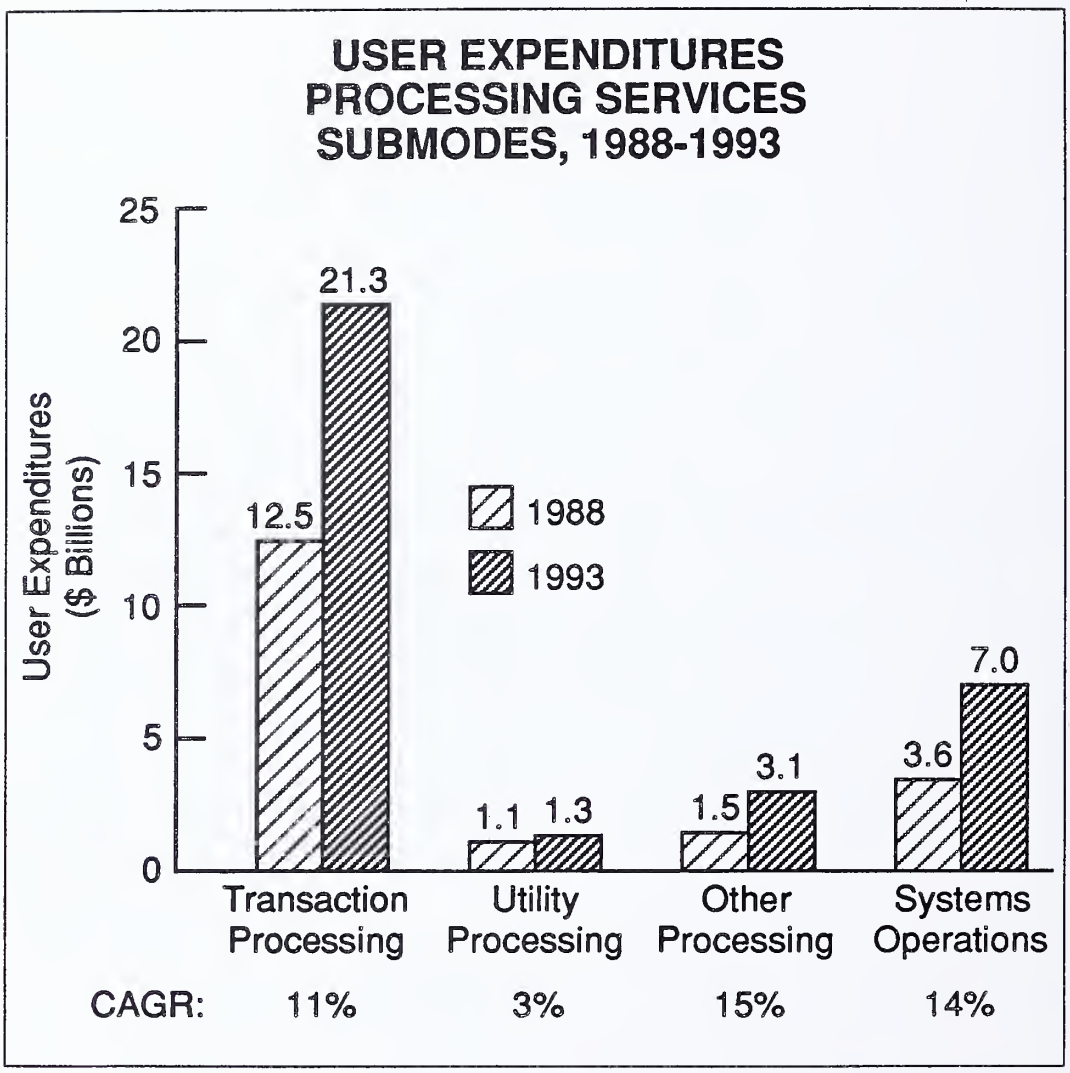
The processing services market is expected to grow at a moderate 12% rate between now and 1993, reaching $32.7 billion as shown in Exhibit IV-1. Currently the largest of the individual INPUT delivery modes, processing services will be surpassed by combined applications and systems software and by professional services during the next five years.

EXHIBIT IV-1



The subsets of the processing services markets exhibit a widely varying set of growth rates, as described in Exhibit IV-2.

EXHIBIT IV-2



1. Transaction Processing

Transaction processing, the largest of these sectors, will grow at a moderate 11%, reflecting market maturity. This market features a concentration of well-established vendors with control in their selected markets, and the continuing impact by PCs, workstations, and minicomputers with comparable solutions at competitive prices. This is not an area that is easy for new vendors to enter. Careful selection of vertical or cross-industry market niches is key to success in this business.

2. Utility Processing

Utility processing is growing at a much slower rate, 3%. In its 1987 report, INPUT forecast this market to have a 7% growth rate. But con-

tinuing inroads into utility processing made by powerful workstations and PCs with ample computational power, memory and disk storage have caused reductions in forecasted growth.

3. Systems Operations (Facilities Management)

Systems operations will grow at a 14% rate, becoming a $7.0 billion market in 1993. Follow-on support for systems integration contracts, and user reliance on vendors to run very complicated mission-critical systems, will fuel this growth.

The "processing services" orientation indicates that the vendor owns the equipment used in the contract. This form of systems operations generated $3.6 billion in user expenditures in 1988. By contrast, systems operations in which the client owned the equipment (included in INPUT's professional services market forecasts) is $1.2 billion in 1988, only one-third the size of vendor-owned systems operations.

Commercial systems operations expenditures (in both processing and professional services) are $3.7 billion in 1988, growing at 14% CAGR. By contrast, the federal sector generated $1.1 billion in 1988 and is projected to grow at 8%, as federal spending is constrained by tight budgets, the Gramm-Rudman bill provisions, and increased scrutiny of major defense procurements.

4. Vertical and Cross-Industry Markets, Processing Services

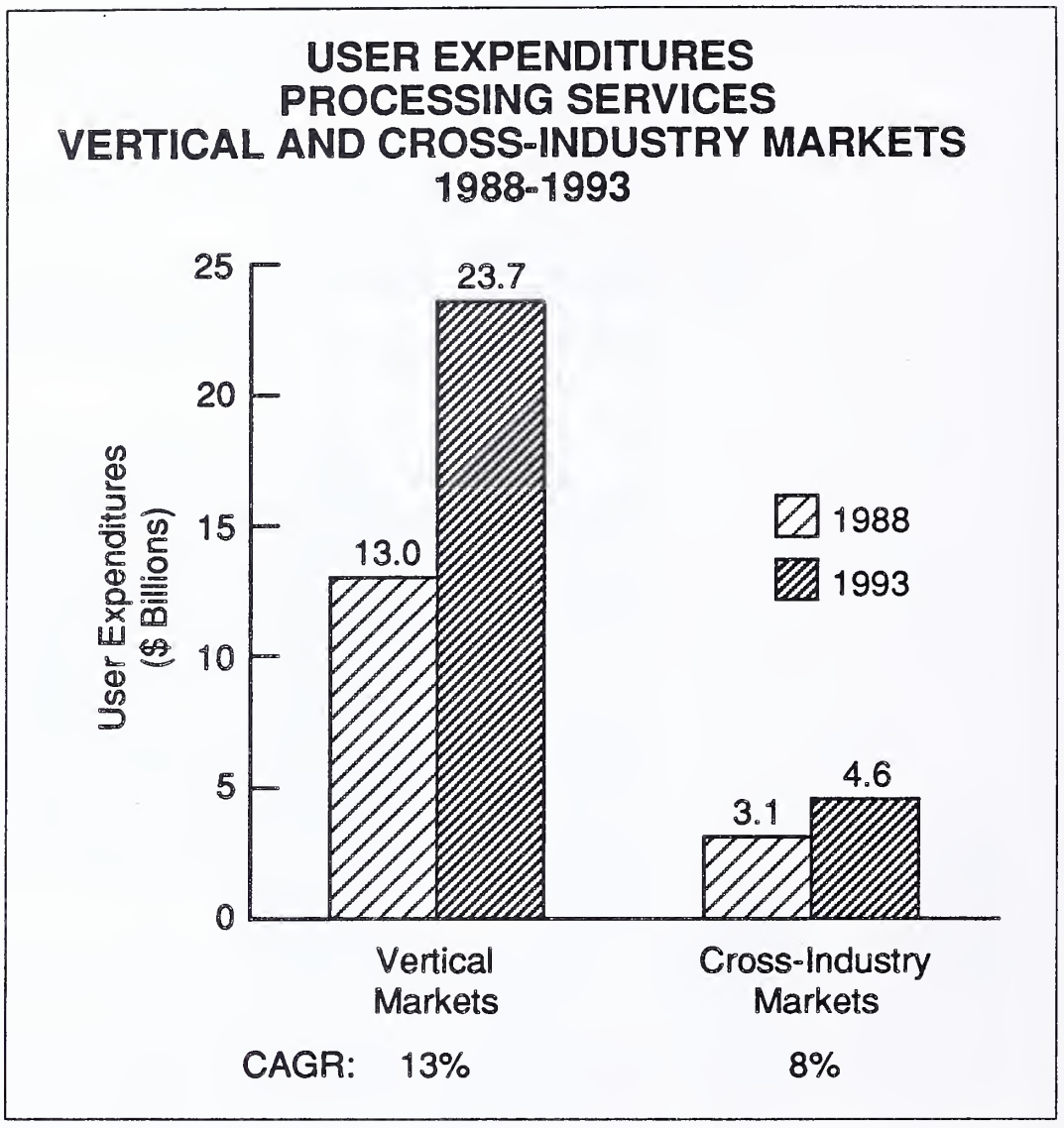
Vertical markets constitute the largest portion of this market, 68% in 1988, and will grow at a 12% CAGR during the forecast period. Since the cross-industry segment is projected to grow at a lower rate (8%), vertical markets will expand and will represent 72% of the total processing service markets in 1993. For details, see Exhibit IV-3.

Vertical markets are the more vital sector because customers are increasingly demanding systems and services specifically oriented to their own business environments. Cross-industry products were installed more frequently in the 1970s, but are now giving way to more targeted vertical solutions.

Banking and finance has long been the leading vertical market, due to many banks' willingness to outsource their high-volume applications to information services vendors or to other banks that provide a service.

Another major market is transportation, where substantial expenditures generated in airline reservations systems accounted for more than $1 billion in 1987.

EXHIBIT IV-3

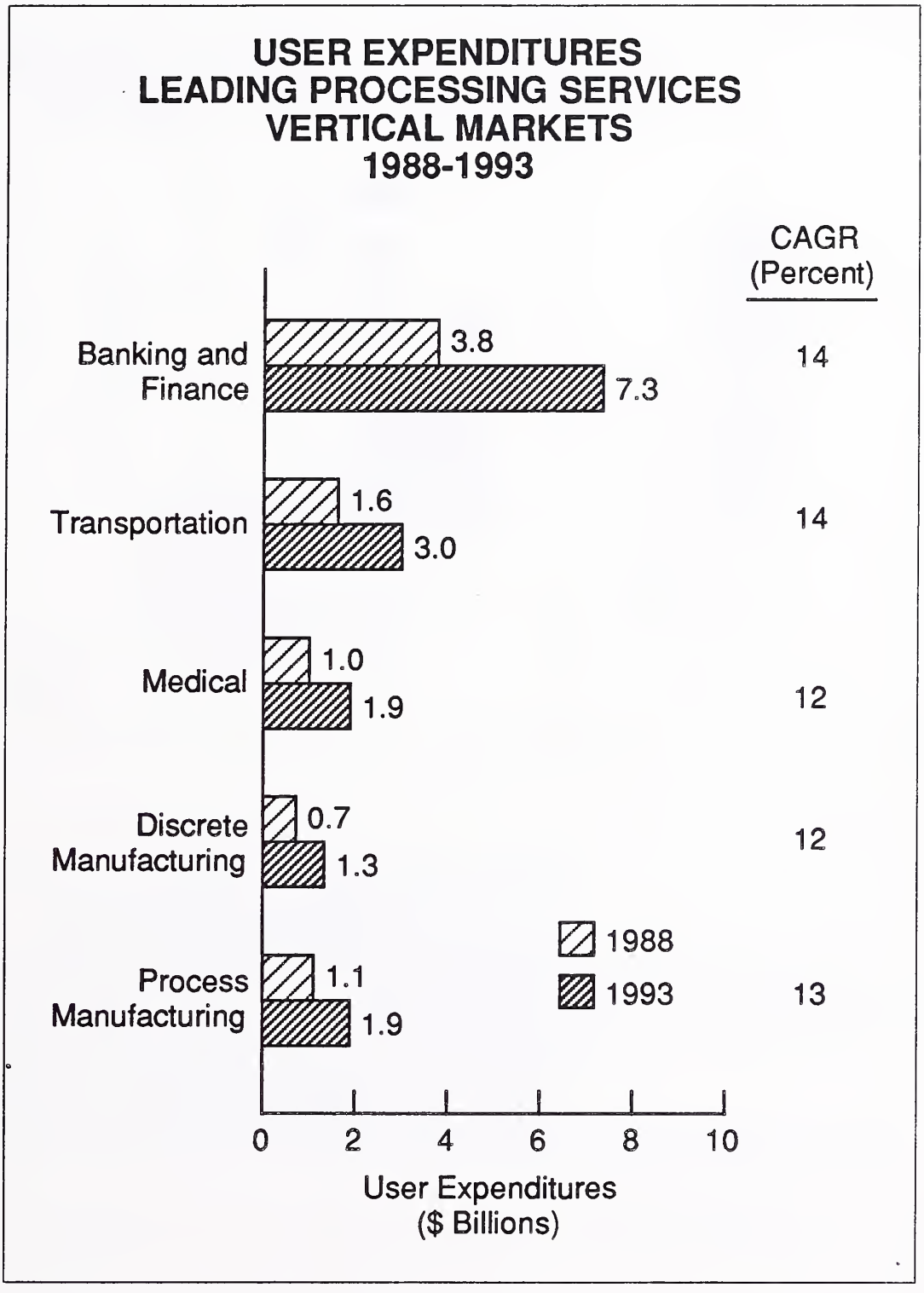


Discrete manufacturing generated nearly $1 billion in 1987 processing services expenditures, driven by vendors' providing batch CAD/CAE/CAM/NC applications on remote mainframes and by shop floor control applications (master scheduling, MRPII, production control, inventory).

Medical market expenditures reached $900 mllion, driven by the continued tendency of hospitals and physicians to use outside services firms to meet their IS needs. Although software products sales are growing rapidly in this sector, a 13% growth rate is still projected for processing services.

Exhibit IV-4 shows these leading sectors. All vertical and cross-industry size and growth rates are shown in Appendix B.

EXHIBIT IV-4



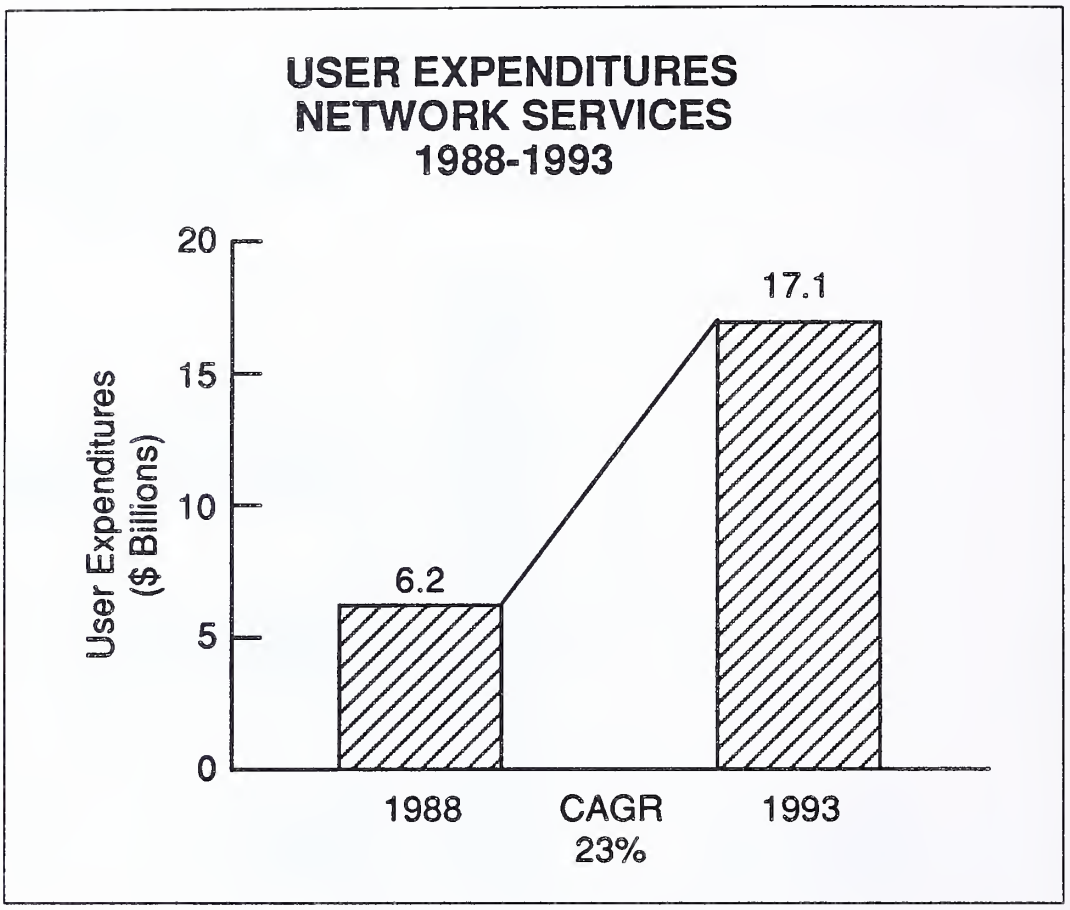
B

Network Services

1. Overview

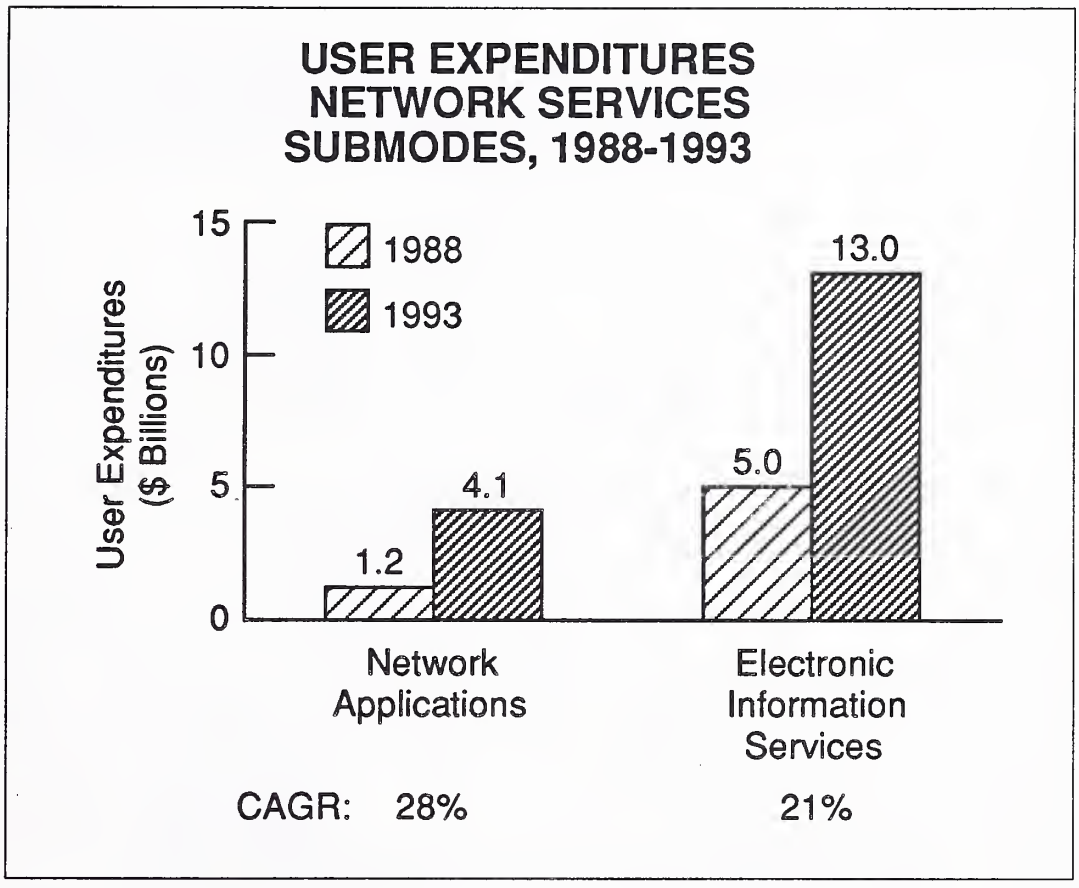
The overall network services market will enjoy a healthy 23% growth rate from $6.2 billion in 1989 to $17.1 billion in 1993, as shown in Exhibit IV-5.

EXHIBIT IV-5



INPUT has divided the network services market into two subsets: the first is network applications, consisting of value-added networks, electronic data interchange, and electronic mail. The second is electronic information services, which include on-line data bases and news data bases. The network applications sector, from a base one-fourth the size of electronic information services, will sustain a higher growth rate, 28%, during the forecast period. The bulk of user expenditures will remain in the electronic information services sector, forecast to grow a 21% and reach $13 billion by 1993. For details see Exhibit IV-6.

EXHIBIT IV-6



2. Network Applications

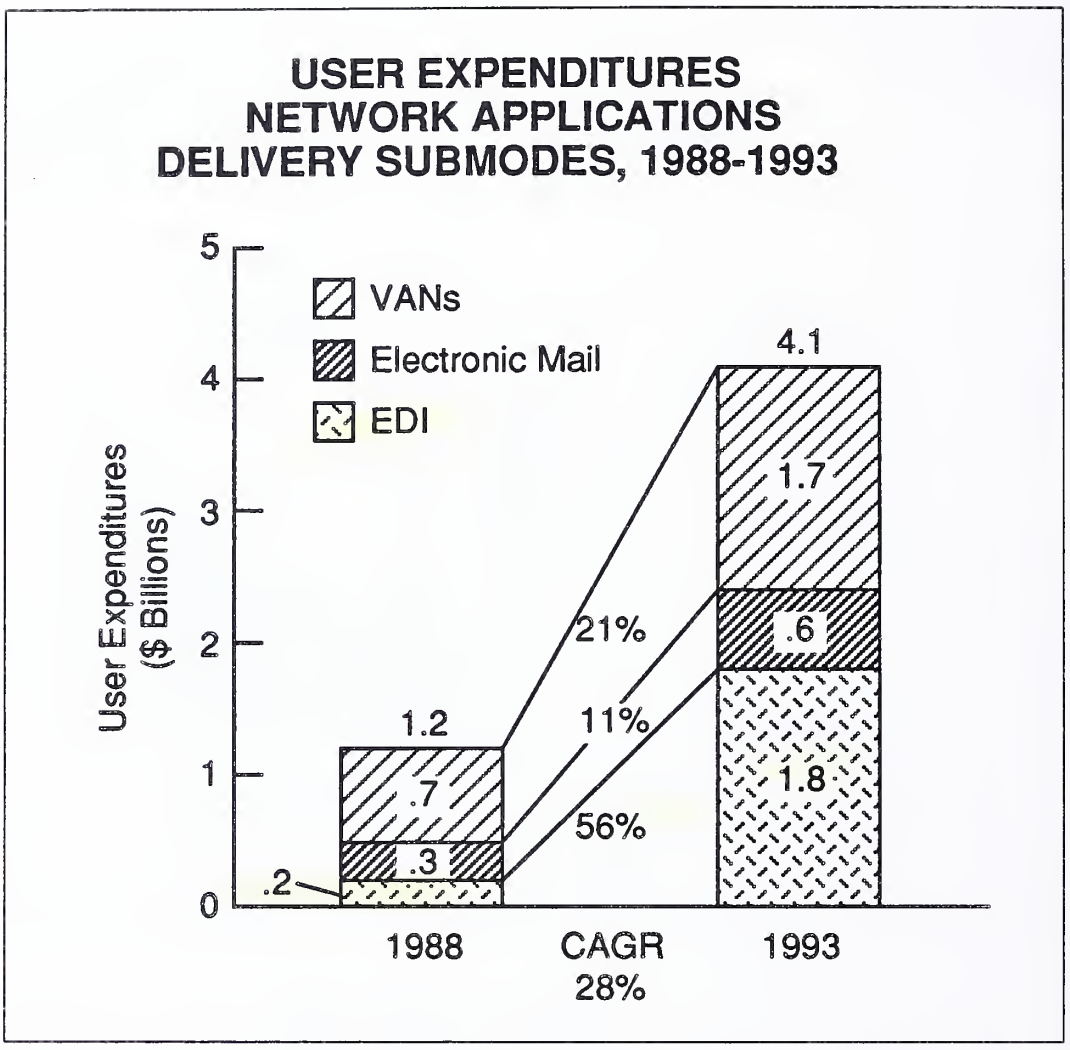
a. Value-Added Networks (VANs)

Exhibit IV-7 displays the growth of the three network applications submodes. Electronic data interchange (EDI), starting from a small base of $200 million, will grow 56% over the next five years and reach a $1.8-billion level by 1993.

Value-added networks are forecast to grow 21% over the next five years. Factors contributing to the growth of value-added networks are:

- The expected explosive growth of electronic data interchange
- The increase of on-line data base usage
- The need to tie disparate locations together
- The continued use of remote processing services
- The emergence of videotex applications later in the forecast period

EXHIBIT IV-7



- The use of virtual private nets to complement the true private nets being designed using T1 hardware

- The significant improvement of VAN node hardware to provide more local functionality

Exhibit IV-8 shows the distribution of expenditures in 1987 among the three submodes of network applications.

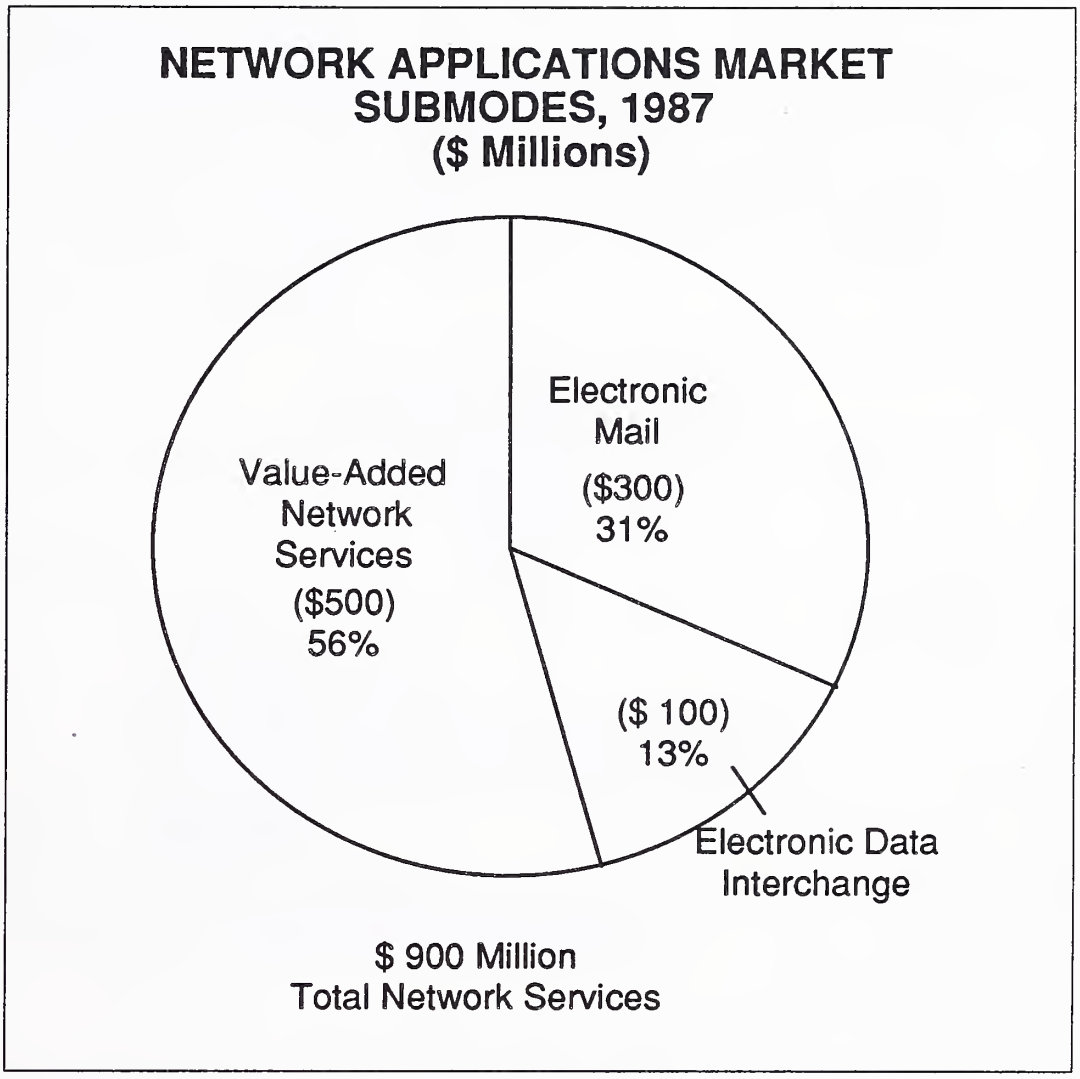
b. Electronic Data Interchange (EDI)

As discussed earlier, EDI will experience a rapid growth, 56% CAGR, to a $1.8 billion level in 1993.

c. Electronic Mail

Slower growth, an 11% CAGR, is projected for electronic mail services, which are being impacted by electronic mail applications implemented on in-house systems.

EXHIBIT IV-8

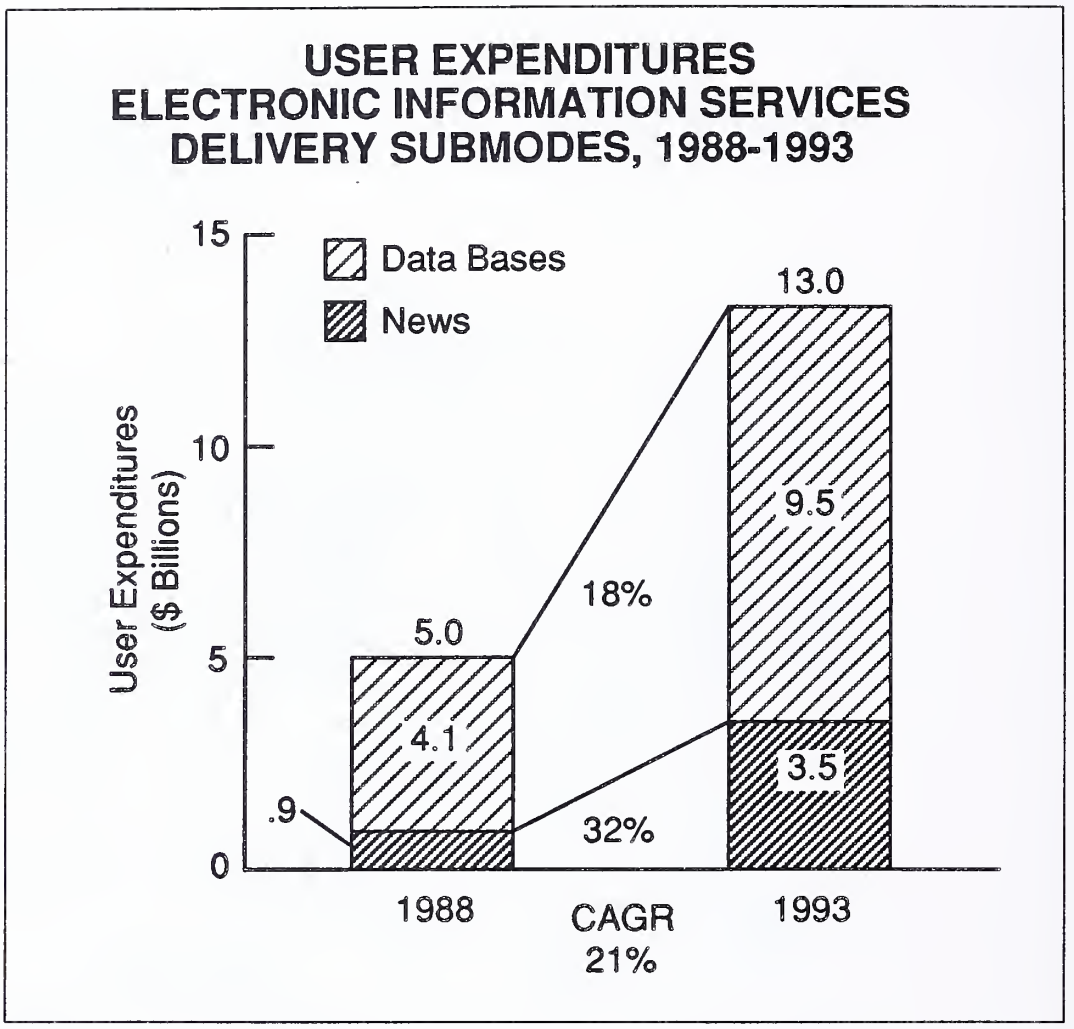


3. Electronic Information Services

Exhibit IV-9 shows the distribution of 1987 EIS expenditures across the three delivery submodes identified in this sector.

On-line data bases (structured) will grow at 19%, from $4 billion in 1988 to $9.5 billion in 1993. Conversations with on-line data base vendors in 1988 reveal strong optimism for the growth of their services. Vendors feel that they have just scratched the surface of demand for these products. This optimism is related to the large installed base of PC applications with high potential for interconnection, the growing market for consumer information services, and the increasing business and personal user demand for information in an immediate, electronically deliverable form. Leaders in this segment include Equifax, TRW Credit Data, Quotron (Citicorp), and Telerate.

EXHIBIT IV-9



News data bases (unstructured), growing from a much smaller base of $700 million, will achieve a $2.4 billion level by 1993, a growth rate of 29%. This growth reflects the increasing business requirement for immediate information for competitive advantage and from consumers for personal convenience in decision making. Vendors are able to deliver tailored news applications to specific customers based on their individual requirements. Leaders in this segment are Dow Jones, Reuters, and Associated Press.

Videotex applications, from a small base of less than $200 million, are forecast to grow at 40%. Given the feeling that videotex services will finally appear as attractive offerings during the early 1990s, introduction of products by Computer Sciences and BellSouth, among others, may fuel the demand for such services. The primary restriction today is acceptance by consumers of this method of interaction with services or product vendors, and price performance attributes of the service. (In future forecasts, INPUT will imbed videotex in the appropriate data base service category.)

4. Vertical and Cross-Industry Markets, Network Services

Exhibit IV-10 differentiates vertical versus cross-industry markets for the network service segment. Starting from the larger base of 3.6 billion, vertical market expenditures will reach the $10 billion level by 1993. Cross-industry markets will also grow from a smaller base at the 23% rate, reflecting the healthy environment in both of these categories.

EXHIBIT IV-10

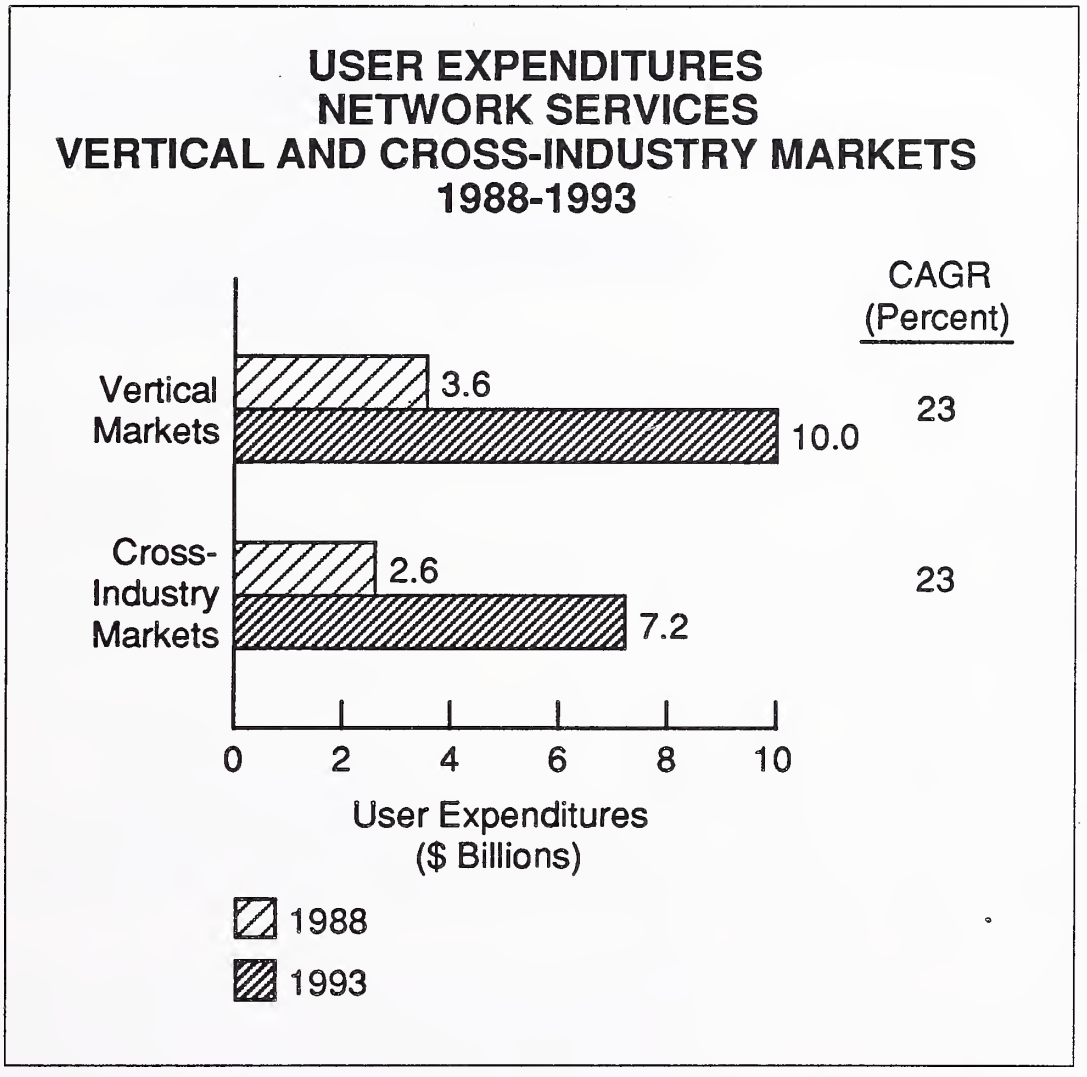
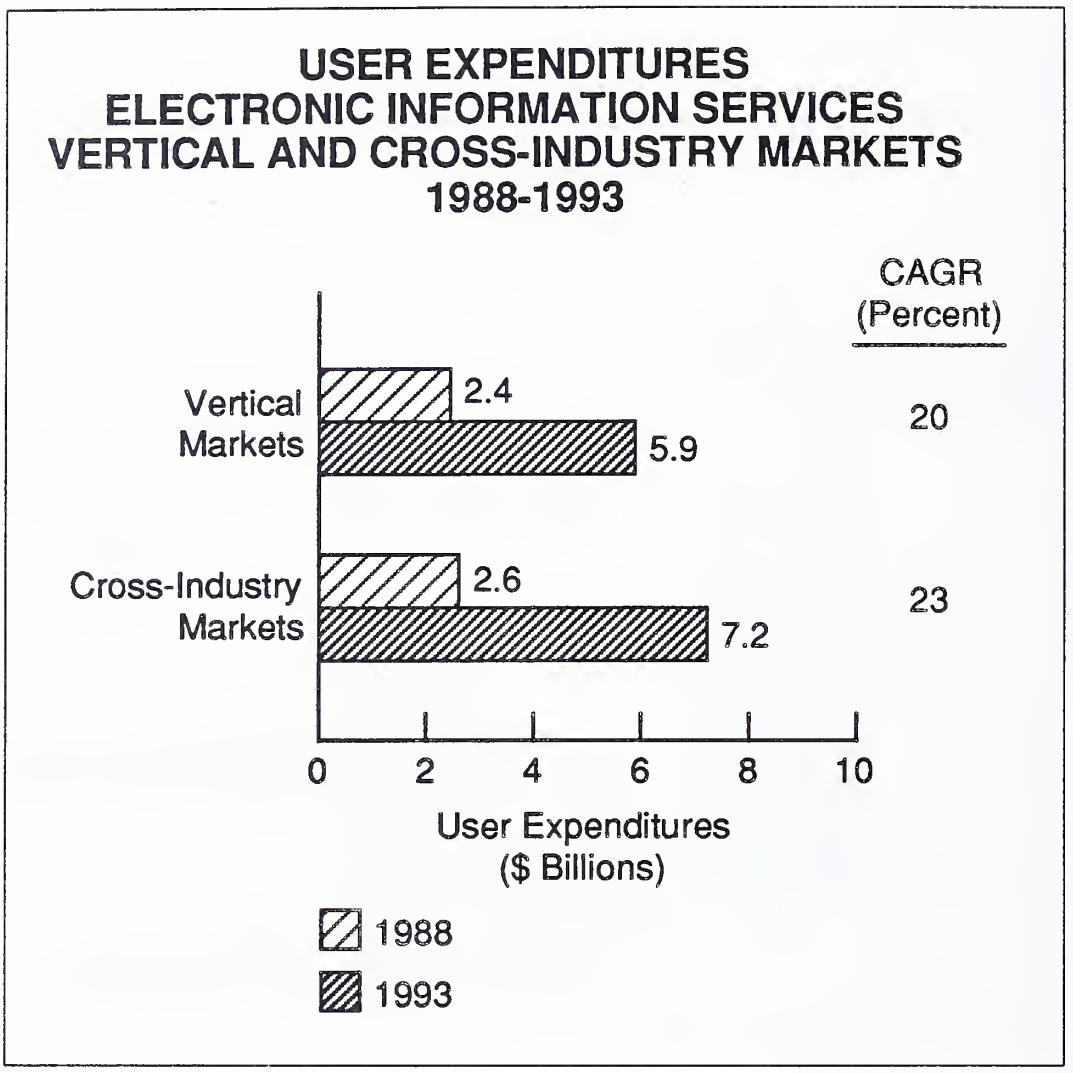


Exhibit IV-11 scopes vertical and cross-industry markets in the electronic information services (on-line and news data bases) subsector of network services. The cross-industry markets—which include on-line securities, credit approval, credit reporting, and text bibliographic services—will grow at a healthy 23% rate during the forecast period. Industry-specific data bases, including those for legal services and medical data bases, will grow at a 20% rate. This contrasts with other information services sectors where vertical market growth exceeds that of cross-industry sectors. In this case, the increasing demand for credit, stock quotations,

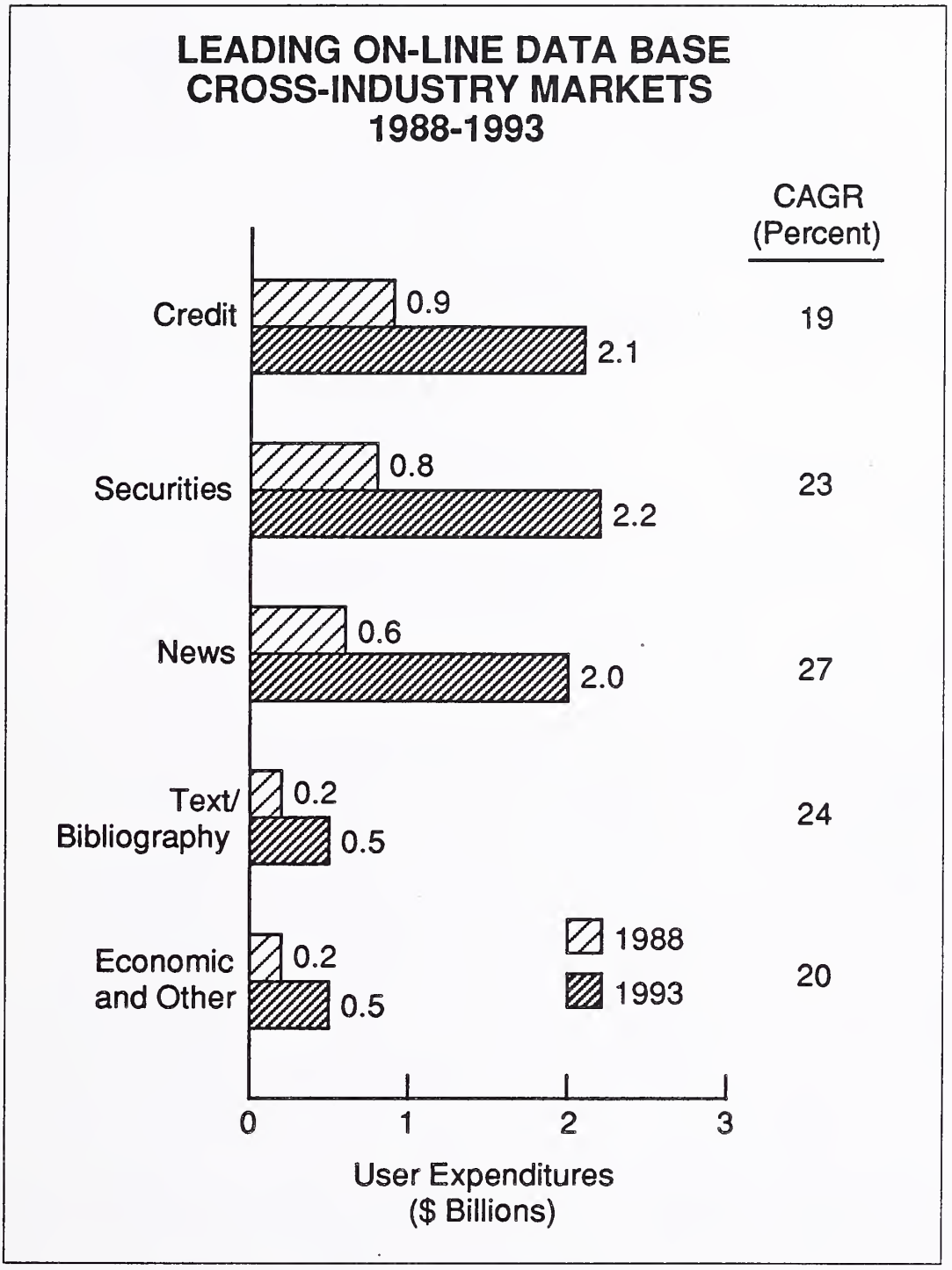
EXHIBIT IV-11



and general bibliographic news and economic data bases—available to and used by a large variety of businesses and individuals independent of their business sector—changes that equation.

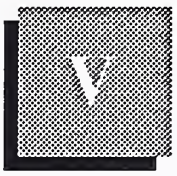
Exhibit IV-12 describes the leading cross-industry data bases and their growth rates during the forecast period. Despite the current woes of the stock market, the convenience of obtaining stock quotations directly from a data base, as opposed to voice communication with a broker, has considerable appeal to large and small investors. Similarly, as the use of credit cards rises and credit ratings remain crucial in purchase approvals, INPUT expects that the percentage of credit authorizations generated electronically will increase substantially—from the 50% rate in the U.S. today to as much as 80% by 1993. This increase will, of course, fuel the growth of data base expenditures in this sector.

EXHIBIT IV-12



The 23% growth rate of the network services sector is the second highest in the information services industry. The outlook is bright for vendors that can merge (1) the network capabilities rapidly evolving into a global communications structure and (2) the marketing of timely information from electronic data bases. If any single trend stands out, it is the rapid growth of the world's network infrastructure during this period. This linkage will stimulate pent-up demand for information and communications-oriented services, functions, and capabilities that are certain to follow.

Vendor Activities and Market Shares



Vendor Activities and Market Shares

A Leading Vendors, Market Shares

Although the network and processing services markets have been separated for analysis in this report, it may be useful to combine the revenues from each sector to determine the overall leading vendors. Exhibit V-1 lists the top ten vendors, which make up 20% of the total market.

ADP, EDS, and McDonnell Douglas Automation are three of only six firms to exceed $1 billion in 1987 total information services revenues in the United States. IBM, Digital Equipment, and Unisys are the others; each of the latter group received much larger revenue contributions from other delivery modes, such as software or professional services.

EXHIBIT V-1

LEADING VENDORS, COMBINED NETWORK AND PROCESSING SERVICES MARKET

Company Name	1987 Revenue ($ Millions)	Combined Market (Percent)
ADP	1,100	5
EDS (& MTech)	820	4
CDC	580	3
Equifax	505	2
CSC	480	2
McDonnell Douglas	425	2
TRW	340	2
First Data	320	2
Shared Medical	275	1
Quotron	270	1
Vendor Total	5,115	20 *
Total Market	25,060	

*Variance due to rounding

Exhibit V-2 lists the leading vendors in the processing services sector. Thirteen vendors have captured 26% of the processing services market.

EXHIBIT V-2

LEADING VENDORS PROCESSING SERVICES MARKET, 1987

Company Name	1987 U.S. Revenue ($ Millions)	Market Share (Percent)
Automatic Data Processing, Inc.	1,040	6
EDS Corporation (& MTech)	820	5
Control Data Corp.	440	3
First Data Resources, Inc.	320	2
CSC Corporation	310	2
Shared Medical System Corp.	275	2
McDonnell Douglas Information Systems Group	230	1
First Financial Management Corp.	175	1
National Data Corporation	155	1
GE Information Services Co.	150	1
IBM	145	1
NCR	140	1
DST Systematics	137 130	1
Leading Vendor Total	4,320	26 *

* 1% variance due to rounding

The dominant vendors in the network services market are listed in Exhibit V-3. In contrast to the processing services sector, 12 vendors have gained a 56% market share, indicating a much more concentrated industry. Neither sector is easy to enter, with considerable capital required for

computers and communications networks. The concentration in the network market reflects the considerable time and effort required to build an electronic data base and support it. The leading vendors are likely to retain their strong position, and it will be difficult for new entrants to displace them.

EXHIBIT V-3

LEADING VENDORS NETWORK SERVICES MARKET, 1987

Company Name	1987 Revenue ($ Millions)	Market Share (Percent)
Equifax, Inc.	505	10
TRW Information Services	340	6
Quotron Systems (Citicorp)	270	5
McGraw-Hill, Inc.	265	5
Mead Data General	225	5
CUC International, Inc.	200	4
McDonnell Douglas Information Systems Group	195	4
Telerate, Inc.	180	4
CSC Corporation	170	4
Sprint (& Telenet) Communication Corp.	170	4
MasterCard	150	3
Control Data Corporation	140	3
Knight-Ridder/Dialog	120	2
Leading Vendor Total	2,930	60 *

*1% Variance due to rounding

1988 2

Exhibit V-4 lists the leading vendors in the systems operations market. This relatively small sector is dominated by the small number of vendors that have already established themselves as having vertical market expertise and the skilled resources required to operate complex computer systems in those markets. EDS is the best known and largest of these firms.

EXHIBIT V-4

LEADING VENDORS SYSTEMS OPERATIONS, 1987

Company Name	1988 Revenues* ($M)	Market Share (Percent)
EDS**	750	16
Computer Sciences	250	4
McDonnell Douglas	200	4
Shared Medical Systems	150	3
Boeing Computer Services	130	3
Systematics	130	3
Martin Marietta	100	2
Mellon Bank	60	1
SEI	50	1
SCT	40	1
Litton	20	<1
		38

* INPUT Estimates

** Non-GM Revenues

An entry path into systems operations in the future may well be through systems integration contracts. Users are likely to feel that the vendor that designed, built, and installed a complex system is in the best position to operate that system.

The largest value-added network (VAN) vendors are listed in Exhibit V-5. Here again, the computers, physical plant, and communications network and expertise required for operation are a formidable barrier to entry.

EXHIBIT V-5

LEADING VENDORS VALUE-ADDED NETWORKS 1987

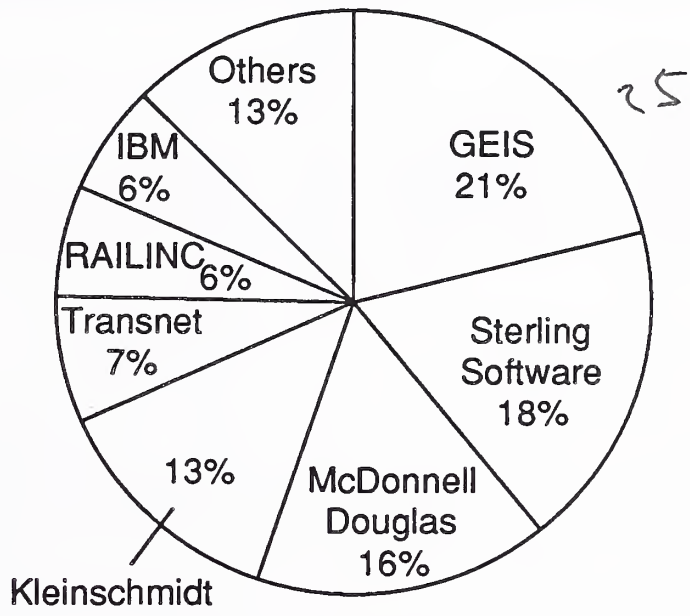
Company Name	1987 Revenue ($ Millions)	Market Share (Percent)
Sprint (Telenet)	125*	22
McDonnell Douglas Network Systems Company	100	18
Computer Sciences Corporation (INFONET)	80	14
IBM Information Network	80*	14
GE Information Services Co. (GEISCO)	60*	11
CompuServe, Inc.	25	4
Leading Vendor Total	470	83

*INPUT estimate

Exhibit V-6 displays leading vendors of the small but fast-growing EDI market. This market is dominated by a small number of firms that entered the business early, attained cooperation from trade associations on a specific communications format, and gained control of a major vertical market's EDI processing.

EXHIBIT V-6

LEADING VENDORS, EDI MARKET, 1987



Total Market = $130 Million

Excludes private networks, electronic medical claims, insurance interface, federal

The electronic mail market leaders are shown in Exhibit V-7. This is the services market, not the in-house product alternative. The market size for internally oriented electronic mail is larger, since enterprises will often install E-Mail systems on premise for their own use.

EXHIBIT V-7

LEADING VENDORS, ELECTRONIC MAIL MARKET 1987

- Western Union Corporation
- Sprint (Telenet) Communications
- CompuServe, Inc.
- McDonnell Douglas
- MCI Communications
- GE Information Services Company (& RCA)
- Dialcom

Exhibit V-8 lists the leaders in on-line data bases. Since this is the largest sector in the network services market, many of the vendors that lead that overall market (Exhibit V-3) appear here as well.

EXHIBIT V-8

LEADING VENDORS, ELECTRONIC ON-LINE DATA BASES (EXCLUDING NEWS) 1987

Company Name	1987 Revenue ($ Millions)	Market Share (Percent)
TRW Information Services	520*	16
Equifax	505*	15
Quotron Systems, Inc. (Citicorp)	270*	8
McGraw-Hill, Inc.	265*	8
Mead Data Central	230	7
CUC International, Inc.	200	6
Telerate, Inc.	180	5
Control Data Corporation	135*	4
IDC (Interactive Data Corporation)	105*	3
Dun & Bradstreet Corp., The	105*	3
Computer Sciences	100	3
Leading Vendor Totals	2,615	79**

*INPUT estimate
** 1% variance due to rounding

Exhibit V-9 displays the primary vendors of electronic news information services. Not surprisingly, the major purveyors of printed news services emerge as the leading players here, since they have recognized the growing market for electronically available news and extended their services accordingly.

EXHIBIT V-9

LEADING VENDORS ELECTRONIC NEWS INFORMATION SERVICES MARKET, 1987

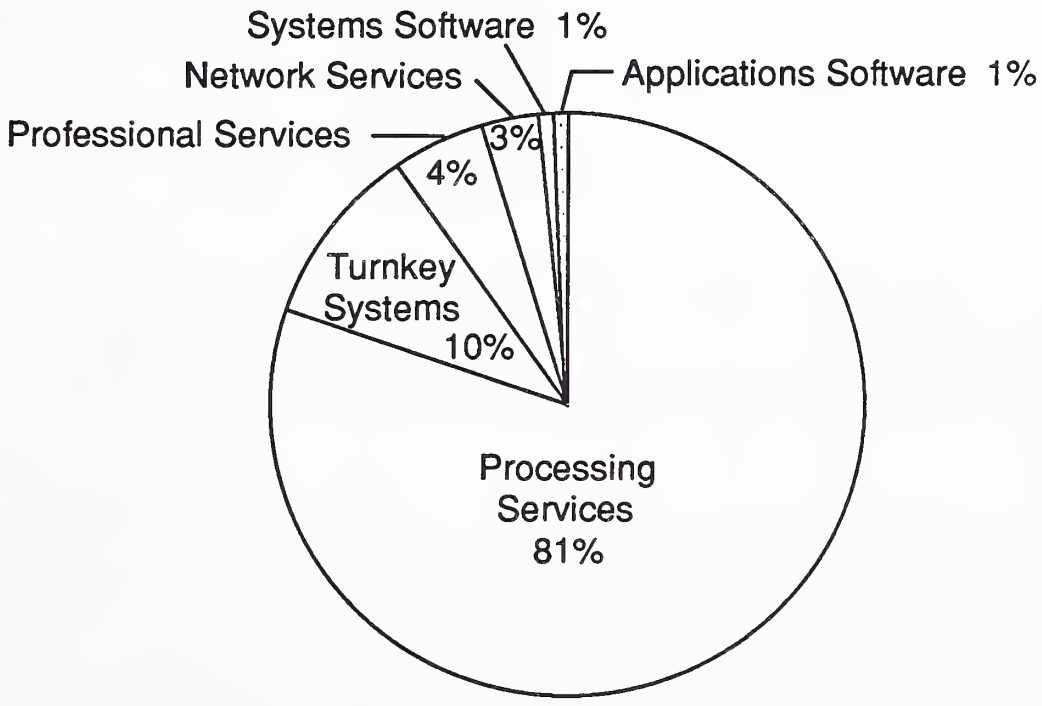
Company Name	1987 Revenue ($ Millions)	Market Share (Percent)
Reuters	105	16
Dow Jones & Co., Inc.	100	15
Telerate, Inc.	90	14
Mead Data Central	70	11
Knight-Ridder (& Dialog)	55	8
Quotron Systems Inc. (Citicorp)	25	4
Total	445	67**

* INPUT estimate
** 1% variance due to rounding

Forty-three processing services firms reported revenue distribution across all delivery modes as a part of the INPUT 1988 vendor survey. (Note: a total of 145 processing services vendors responded, but many are not active in other delivery modes.) That distribution is shown in exhibit V-10. Of course, processing services revenue comprised the majority of these vendors' activity. Of interest is the 10% generated from turnkey systems, reflecting the movement into this delivery mode by processing services companies seeking to expand their market and also provide an alternative for their existing customer base.

EXHIBIT V-10

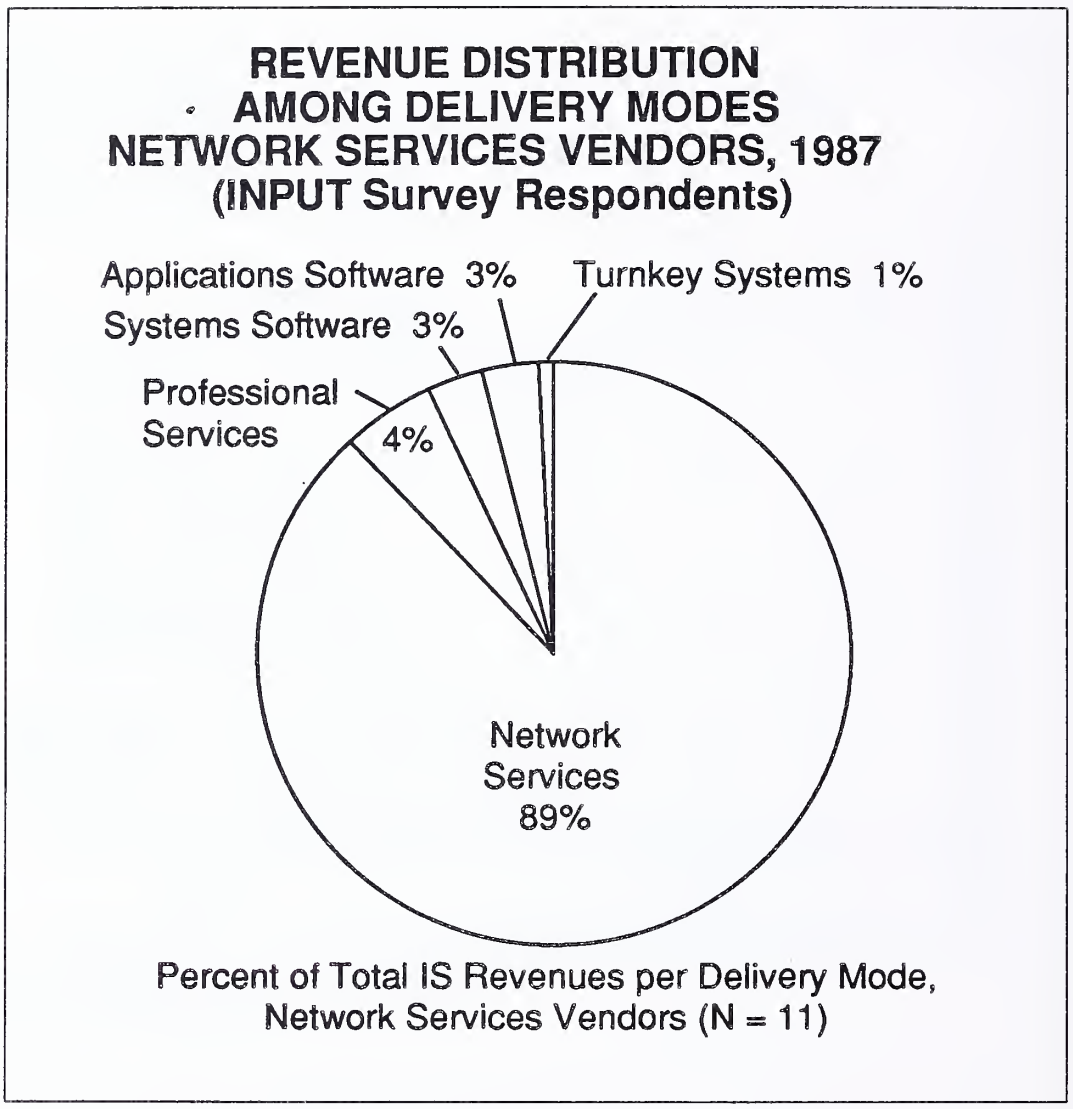
REVENUE DISTRIBUTION AMONG DELIVERY MODES PROCESSING SERVICES VENDORS, 1987 (INPUT Survey Respondents)



Percent of Total IS Revenues per Delivery Mode, Processing Services Vendors (N = 43)

Exhibit V-11 shows the same type of revenue distribution for the eleven network services firms (out of 51 survey respondents) that have significant revenues from other delivery modes. This sector shows heavy reliance on the primary delivery mode—network services—with minor contributions from professional services and software.

EXHIBIT V-11



B

Vendor Profiles

Following are brief profiles of some of the leading vendors in both market sectors. These profiles deal only with a given vendor's position and activities in the processing and network services markets. A number of these companies also have significant presence in software, turnkey systems, professional services, or systems integration markets, but those activities are not discussed here.

Complete profiles of some 400 information services vendors are available from the INPUT Vendor Analysis Program.

COMPANY PROFILE

AUTOMATIC DATA PROCESSING, INC.

106 Apple Street
Tinton Falls, NJ 07724
(201) 758-7500

The Company

Automatic Data Processing, Inc. (ADP) was formed in 1949 as Automatic Payrolls Inc. Its name was changed to Automatic Data Processing in 1960. From 1949 to 1961, its payroll services were performed on unit record equipment. In 1961 ADP computerized its operations and went public.

Since the early 1960s, ADP has implemented an active acquisition program to diversify from its primary business of providing payroll services. Payroll and accounting services still provide the major share of ADP's revenue; however, significant gains have been made in brokerage, banking, and thrift services, services to automotive dealers, and collision estimating services for the insurance industry. The company now provides information and processing services to more than 150,000 clients worldwide.

ADP management attributes the company's continued growth in revenue and earnings to the expansion of its client base, new product offerings, and acquisitions in new market areas.

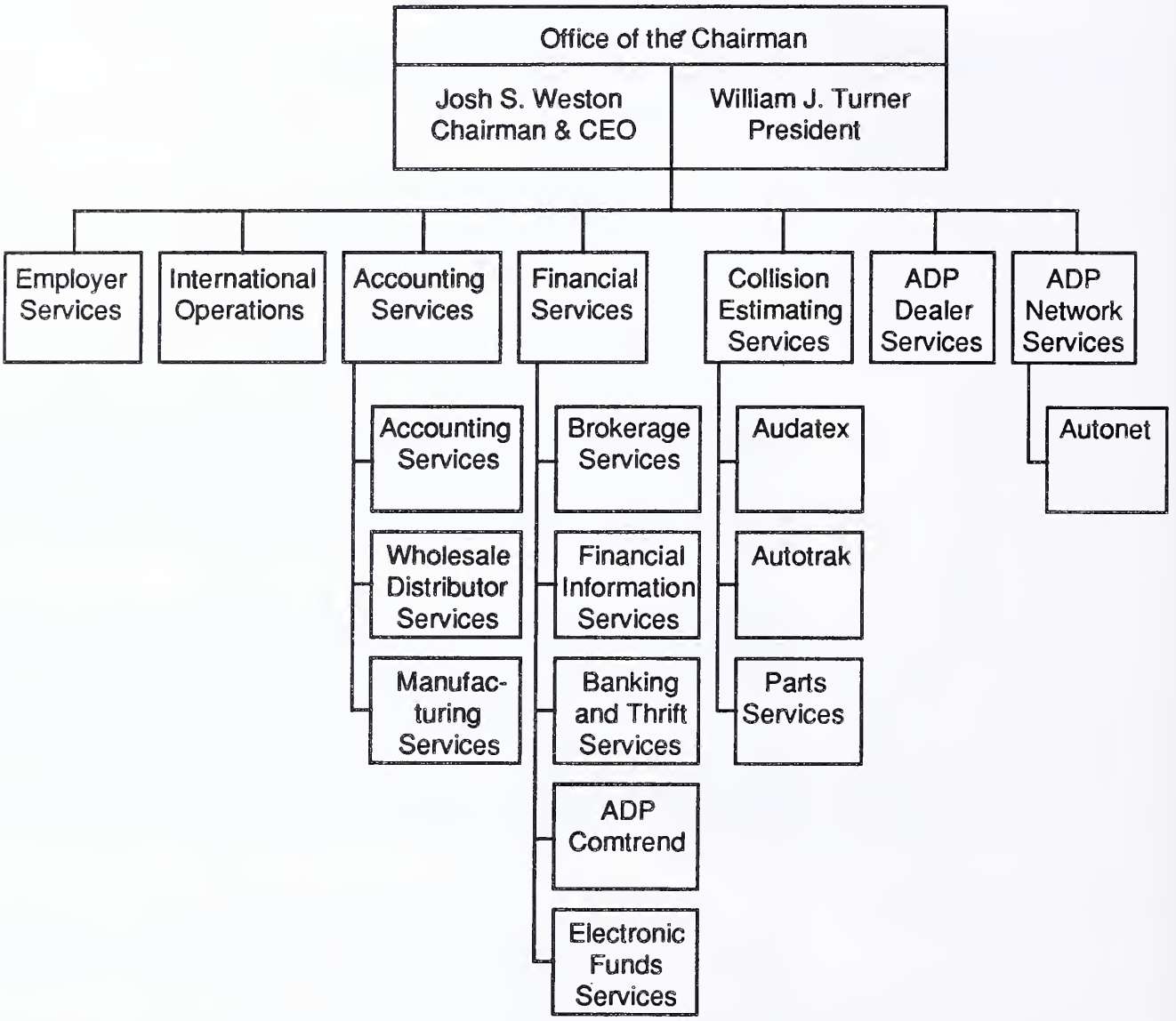
ADP's current organization structure is shown in the exhibit. The company is currently organized into seven major groups, as follows:

- Employer Services provides payroll processing, payroll tax filing, job costing, labor distribution, unemployment compensation management, and personnel information services.

- Accounting Services provides batch and interactive accounting processing services through three separate business units as follows:

  - Accounting Services provides generic accounts receivable, accounts payable, time analysis, and general ledger/financial reports.

ADP ORGANIZATION CHART



- Wholesale/Distributor Services provides order entry, invoicing, accounting, and inventory services, and other front-end back-office applications for small-to-medium sized wholesalers and distributors.

- Manufacturing Services provides accounting, planning, production control, and distribution software for small- to medium-sized manufacturers.

• The Financial Services Group includes the following businesses:

- Brokerage Services provides "back-office" recordkeeping services.

- Financial Information Services provides data base and stock quotation services to the investment/brokerage industry.

- ADP Comtrend provides an on-line service for commodity, currency, and interest rate futures trading.

- Banking and Thrift Services provides various accounting processing services to banks and savings and loan associations.

- Electronic Funds Services provides automated teller machine (ATM) services to the financial and retail industries.

- Collision Estimating Services provides claims estimating processing services to automobile insurers, manufacturers, and repairers.

- ADP Dealer Services provides accounting and specialized computing services to auto, truck, and farm equipment dealers.

- ADP Network Services provides remote computing and on-site distributed processing services and packet switched value-added public data network services.

Industry Markets

ADP's revenue is primarily derived from banking and thrift institutions, brokerage firms, corporate payroll and financial processing, manufacturers, accounting firms, insurance companies, and automotive dealers.

Geographic Markets

Approximately 95% of ADP's revenue is derived from U.S. operations, with the remainder from foreign sources, including the United Kingdom, Western Europe, Canada, and Brazil.

Computer Hardware

ADP uses more than 100 mainframes, exclusive of minicomputers, in its various data centers.

- ADP Network Services maintains its primary data center in Ann Arbor (MI). Equipment used to provide network services includes a large number of DEC System 10s and 20s and DEC VAXs.

- Employer and Accounting Services maintains about 45 data centers in various locations in the U.S. and Europe. Computer equipment installed is predominantly IBM 4300 systems and Magnuson mainframes.

- Financial Services maintains a new data center in New York City using primarily Amdahl and IBM systems.
  - ADP Financial Information Services' data centers in Mt. Laurel (NJ) and Trumbull (CT) have primarily IBM and DEC VAX computers installed.
  - Banking and Thrift Services data centers are in Chicago, Atlanta, Cherry Hill (NJ), and Houston. Equipment in the centers consists primarily of IBM 4300s and Magnuson mainframes.
- Dealer Services' primary data center, located in Schaumberg (IL), has Microdata computers installed.
- ADP Collision Estimating Services uses the Network Services data center in Ann Arbor to provide services to its clients.

COMPANY PROFILE

CCX NETWORK, INC.

301 Industrial Blvd.
Conway, AR 72032

The Company

CCX Network (name recently changed to Acxiom Corp.) provides data processing services for the direct (targeted) marketing industry in the United States and the United Kingdom.

The company provides a full range of services to businesses that utilize direct marketing techniques such as mail order and catalog sales, prospect generation, and telemarketing.

CCS Network's revenues increased 101% in 1987 to $48 million, and net income rose 73% to $3.2 million.

In 1986, CCX Network formed service agreements with the United States Postal Service and Standard Rate & Data Service, Inc.

In 1987, types of service offerings were expanded through acquisitions, mergers, and a joint venture with an international advertising agency. As a result, the company's services now include data base management, list processing, list enhancements, telemarketing, mail preparation, order fulfillment, and marketing analysis.

CCX's primary vehicle for providing its services is its network of terminals through which direct marketing customers receive authorized access to lists and data bases maintained by CCX.

Management indicates that its continuing strong growth rate in revenue relates to a strong growth rate overall of mail order sales companies and an expansion in the number of services it provides, from acquisitions to internal development.

COMPANY PROFILE

COMPUTER SCIENCES CORPORATION

2100 East Grand Avenue
El Segundo, CA 90245
(213) 615-0311

The Company

Computer Sciences Corporation (CSC), founded in 1959, is the largest independent professional services company in the industry. Serving government and commercial clients, CSC provides requirements analysis, software development, systems engineering and integration, communications, systems engineering, turnkey computer-communications systems, and facilities management services. The company also provides industry-specific proprietary products and services for credit reporting, claims processing, health maintenance organizations, income tax preparation, and manufacturing and distribution applications. It also provides value-added communications and remote computing services via INFONET, CSC's international data communications network.

CSC's management objectives are to continue to maintain strong revenue growth and a leading position in the federal government marketplace (which contributed two-thirds of CSC's fiscal 1987 revenue), while increasing the percent contribution of revenue from its non-federal markets through both internal growth and acquisitions. The company plans to invest over $200 million in acquisitions by fiscal 1991, primarily in professional services and the fields of consumer finance, health care, and insurance. The company is also giving major attention to the emerging commercial and international markets for systems integration services, drawing on its experience in large federal systems integration programs.

CSC provides its products and services through the following operating groups:

- Federal Systems and Services, represented by the operations of CSC's Systems Group (headquartered in Falls Church, VA), is the company's primary provider of technical services to the federal government. Services provided include system engineering and integration, the development of custom-designed computer-based systems and communications systems, operational support of clients' technical activities, clients' computer facilities management, and turnkey system development.

- The Systems Division, headquartered in Falls Church (VA), primarily designs and builds systems for office information, digital documentation, and administrative support.

- The System Sciences Division, headquartered in Silver Spring (MD), provides systems engineering, analysis, software development, and end-to-end integrated data systems and services primarily to aerospace clients such as NASA and the FAA.

- The Network Systems Division, headquartered in Falls Church (VA), designs and builds communications networks and real-time telemetry systems for military and civil agencies of the government.

- The Special Projects Division, headquartered in Falls Church (VA), performs high-level technical management projects, known as systems engineering and technical assistance (SETA), for the government. The division also performs research and development in systems and software technologies, and special activities in signal processing, communications systems, and information processing.

- The Systems International Division, headquartered in Herndon (VA), markets and supports systems and consulting contracts in the Middle East, Asia, and South America.

- The Applied Technology Division, headquartered in Falls Church (VA), provides facilities management services to aircraft and weapons test centers and provides software development support to federal agencies. This division includes the operations of the former Energy Research Division, which manages a contract with the Department of Energy.

- The Defense Systems Division, headquartered in Moorestown (NJ), designs and develops military systems for weapons control, logistics, wargaming, training, and command and control.

• Health and Insurance Systems provides processing services, turnkey systems, and associated services through two separate business units.

- The Health and Administrative Services Division, headquartered in Sacramento (CA), performs Medicaid facilities management processing for state governments, manages the National Flood Insurance Program for the Federal Emergency Management Agency, and processes black-lung medical claims for the Department of Labor.

- CSC Comtec, Inc., headquartered in Farmington Hills (MI), provides turnkey systems and services to health maintenance organizations, preferred provider organizations, third-party administrators, and traditional indemnity plans.

- Professional Services, headquartered in El Segundo (CA), provides requirements analysis, system design, software development, system engineering and integration, communications systems engineering, and facilities management for non-federal organizations in industry and government. Several recent acquisitions have increased CSC revenues and presence in this category of service.

  - Index Systems, a prominent professional services firm based in Cambridge (MA)

  - Computer Partners Inc., a wholly owned subsidiary based in Waltham (MA)

  - Communications Industry Services, based in Piscataway (NJ), which specializing in services to telephone companies

- Computer Sciences Europe, headquartered in Brussels, manages the activities of subsidiaries in Belgium, the Netherlands, Switzerland, the United Kingdom, and West Germany. These units provide commercial professional services as described above, and market and support INFONET data communications services in Europe.

- Credit Services provides consumer credit reporting and collection services to credit grantors and independent credit bureaus through Associated Credit Services, Inc., a wholly owned subsidiary based in Houston (TX).

- Network Services, headquartered in El Segundo (CA), provides value-added network services, enhanced data communications services, and remote computing services on an international basis. Service is focused on international markets for data communications.

  - The INFONET Division, headquartered in El Segundo, markets data communications services to commercial and international clients.

  - The Government Systems Division, headquartered in Arlington (VA), markets remote computing and data communications services to agencies of the federal government.

  - The Development and Operations Division, headquartered in El Segundo, supports R&D application development, data center operations, and maintenance of the network.

- Complementary Services provides industry-specific products and services.

- The TACS Division, based in Los Angeles (CA), processes income tax returns for tax preparers.

- CSC Compufact, Inc., headquartered in Garden Grove (CA), provides turnkey systems, application software, and professional services to manufacturers and distributors.

- CSC's current organization structure is shown in the exhibit.

- In July 1986 CSC acquired Computer Partners Inc. (Waltham, MA). Terms of the cash purchase were not disclosed.

  - Computer Partners provides consulting and systems development professional services to Fortune 1000 corporations and other large users of computers.

  - Computer Partners' annual revenues exceeded $20 million and the company had 300 employees at the time of the acquisition.

  - Computer Partners now operates as a wholly owned subsidiary of CSC within CSC's Professional Services operations.

- These purchases are part of a $200 million five-year strategic acquisition program begun in April 1986 to augment CSC's commercial business in credit services, health and insurance systems, professional services, and network services.

Major competitors by primary service/product area include the following:

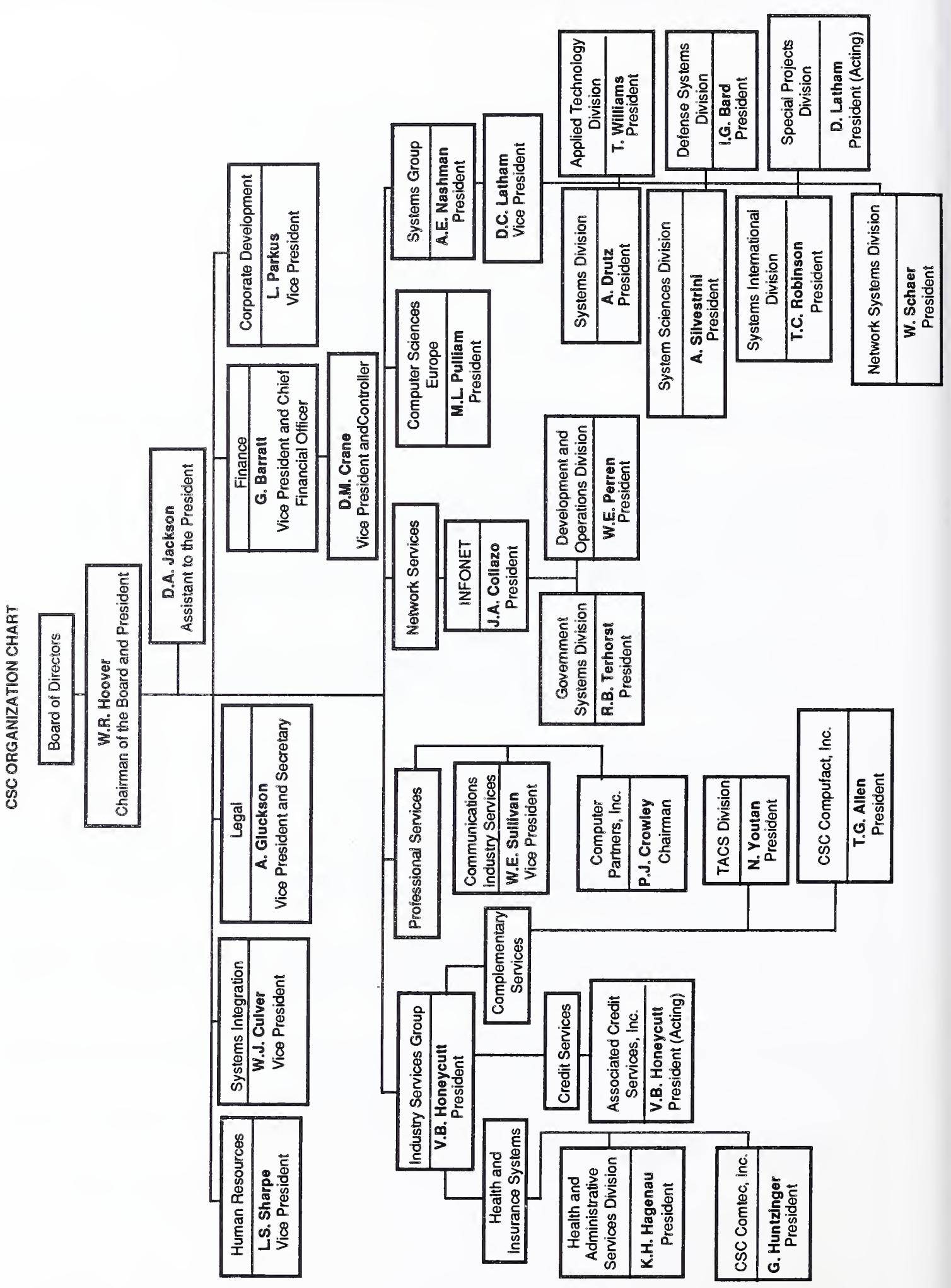
- Federal government professional services: TRW, Hughes Aircraft, IBM Federal Systems, Planning Research Corporation (PRC), General Electric, AT&T, Unisys (System Development Corporation), and Ford Aerospace & Communications Co.

- Commercial professional services: Arthur Andersen, Electronic Data Systems (EDS), IBM, Martin Marietta, Computer Task Group, and AGS Computers

- Value-added network services: U.S. Sprint (Telenet) and McDonnell Douglas Network Systems (Tymnet)

- Remote computing services (to federal agencies): Boeing Computer Services

- Medicaid claims processing: Blue Cross/Blue Shield and EDS



- Credit reporting service: TRW Information Services, Equifax, Chilton, and TransUnion
- Health-care systems: Jergovan and Blair, Inc.
- Manufacturing/distribution products: ASK Computer Systems and Triad Systems

Geographic Markets

CSC maintains offices in principal cities throughout the U.S. Operations in Canada, the United Kingdom, Belgium, Germany, the Netherlands, and Switzerland are through subsidiary companies.

CSC owns minority interest in affiliates in Venezuela, Australia, France, and Sweden.

INFONET services are provided through subsidiaries, affiliates, or representatives in Canada, Argentina, Brazil, Chile, Mexico, Uruguay, Japan, Korea, Hong Kong, Taiwan, Philippines, Singapore, Australia, New Zealand, South Africa, Denmark, Finland, Sweden, Norway, Belgium, West Germany, The Netherlands, Italy, Spain, Switzerland, France, and the United Kingdom.

Computer Hardware and Software

INFONET provides remote computing services from data centers in El Segundo (CA), Beltsville (MD), and Toronto, Canada. A total of five Unisys 1100/82 systems are installed, operating under CSC's proprietary operating system CSTS II. The Beltsville center also has IBM 3081-KX and 3084-QX systems installed.

- CSC has developed its own communications network, using leased facilities, to provide remote computing services in North America, Australasia, Europe, and the Far East. International record carriers are used in other locations.
- Local access to INFONET is provided throughout the U.S. by CSC's own network (over 150 cities)—INWATS—and gateways to other domestic networks.

Other data centers operated by CSC include:

- Associated Credit Services' data center in Houston uses Amdahl V/8 and 5880 mainframes and DEC VAX 8650 and VAX-11/785 systems.
- Health and Administrative Services Division: An Amdahl 5867 is installed in Sacramento (CA) for Medicaid claims processing.
- Pittsburgh data center: General, hospital, and insurance processing services are offered on IBM computers.
- TACS Division: Magnuson computers are installed in Los Angeles and Bensonville (IL).

COMPANY PROFILE

CUC INTERNATIONAL, INC.

707 Summer St.
P.O. Box 10049
Stamford, CT 06904-2049

The Company

CUC International, formerly Comp-U-Card International (name changed in 1987) provides electronic home catalog services accessed by personal computers or by telephone, an industry the company pioneered in the early 1970s.

Customers pay $39 a year for access to its data base of over a quarter million name-brand products. A major benefit to the consumer is the potential for obtaining discounts on brand-name merchandise as high as 50%.

CUC International's revenues increased by 40% in 1987 to approximately $199 million, and net income rose by 105% to $17.4 million.

The company itself does not handle an inventory of products. Rather, its computers have access to a list containing the latest bids from several hundred distributors, wholesalers and retailers, and then lists the best price. CUC places the order to the lowest bidder, and the merchandise is then delivered to the customer's home.

As a result of acquisitions over the past several years in such vertical markets as insurance, travel services, legal services, and credit card protection, CUC International has now become a leading consumer membership services company with more than 10 million consumers. Through its Comp-U-Store On-Line electronic network, it provides customers access to a variety of home shopping services, including travel, insurance, and extended warranties.

In the fall of 1987, Comp-U-Store On-Line announced its plans to reposition its on-line shopping service to concentrate on discounted products.

Its PC-delivered services are available through six major information networks: CompuServe, Dow Jones News/Retrieval, The Source, Quantum, Genie, and Delphi. A yearly membership is $25. Presently, more than 60,000 PC owners shop from their home through Comp-U-Store's on-line service.

CUC's Comp-U-Card division also markets its services to credit card customers of the nation's largest financial institutions, major retailers, and oil companies. Its FISI Madison Financial Corporation, National Card Control, Inc. (NCC), and Benefit Consultants, Inc. (BCI) subsidiaries also provide services to checking accounts of banks and savings and loan associations and to members of credit unions.

Management attributes its continuing strong growth to an expansion in its service offerings, several new client agreements, and particularly strong growth in its travel service segment.

COMPANY PROFILE

DST SYSTEMS, INC.

1004 Baltimore Avenue
Kansas City, MO 64105

The Company

DST Systems is a leading supplier of data processing services such as mutual fund shareholder accounting and recordkeeping to the mutual fund industry. In addition, the company provides data processing services to such other financial services industry groups as brokerage firms, insurance companies, and banks.

DST Systems' revenues increased by 37% in 1987 to $137 million, and net income expanded 50% to $19.8 million.

The company's success is based in large part on its continuing ability to bring creative new product solutions to the financial industry, its ability to increase prices on a regular basis, its continued investment in new software and computer facilities, and the strong growth in mutual funds and other types of managed investment accounts.

DST provides four basic processing systems, all of which are available on either an on-line or real time basis.

The four systems are as follows:

- The Mutual Fund System is a shareholder recordkeeping system used by money market funds, equity funds, fixed-income funds, limited partnerships, and others.
- The Securities Transfer System provides recordkeeping of traded securities for banks that choose to process locally, but require computerized interface with New York agents.
- The Insurance Recordkeeping System provides a recordkeeping system for equity-based insurance policies such as flexible premium or variable annuities.

- The Portfolio Accounting System tracks the underlying investments in mutual funds or in equity-based insurance programs.

DST is also a partner with other financial services companies: Boston Financial Data Services (State Street Boston Corp., partner) (BFDS); Investors Fiduciary Trust Company (Kemper Financial Services, Inc., partner) (IFTC); and Vantage Computing Systems, Inc. (Monarch Capital Corporation, partner) (VCS).

COMPANY PROFILE

ELECTRONIC DATA SYSTEMS CORPORATION

7171 Forest Lane
Dallas, TX 75230
(214) 661-6000

The Company

Electronic Data Systems Corporation (EDS), founded in 1962, is a leading computer and communications services company providing information processing, systems management, and communications services for the banking, manufacturing, retail, and telecommunications industries. Other major markets include insurance companies, government-funded health insurance, credit union processing services, government professional services, and health-care systems.

Effective October 18, 1984, General Motors Corporation (GM) acquired Electronic Data Systems Corporation (EDS) and its subsidiaries for approximately $2.5 billion.

In early December 1986, GM bought out founder Ross Perot's stock for over $700 million. The buyout paid Perot and three other high ranking EDS executives nearly twice the current market price for their Class E stock. At the same time, GM formed a new business unit for its high-technology defense and electronics activities headed by Donald J. Atwood that includes EDS, Hughes Aircraft, Delco Electronics, and GM's other defense operations.

In November 1986, it was made known that General Motors and EDS had conducted two months of negotiations with AT&T with the intent of establishing a major processing contract with AT&T. Although the discussions have been discontinued, AT&T and EDS will continue to have a close relationship. The companies signed a long-term contract in January 1985 to jointly develop and sell specialized computer services and products to large corporate users. This contract brought several contracts to the vendor team during 1986.

The GM acquisition has generated four major business opportunities for EDS: factory automation, automation of employee benefits, communications, and international. During 1986, EDS operations were organized into the following major units:

- Government Systems provides facilities management, including state-controlled health-care (or Medicaid) activities, and systems integration services to federal, state, and local government customers.

- The Financial and Insurance Group combines EDS's traditional business with banks, savings and loans, and credit unions, its facilities management insurance business (including Blue Cross/Blue Shield, where state money is not involved), its work in GM's benefits administration, and its work for GMAC.

- The International, Commercial, and Communications Services Group supports the following businesses:

  - International—all activities outside North America

  - Communications Services—all communications projects

  - North American Commercial—non-GM facilities management and systems automation for the manufacturing, distribution, and retail industries

- GM North America supports GM.

In 1988 EDS acquired MTech, a bank processing services firm with annual revenues of $230 million, at a price of $340 million. EDS also acquired M&SP, a telecommunications services company based in Lyndhurst (NJ).

Other acquisitions made by EDS include the following:

- In April 1987 EDS acquired Amtec Information Services, Inc. of Lakewood (CA).

  - Amtec published technical manuals and service catalogs for the automobile, aviation, and legal industries.

  - Amtec, with 267 employees, recently introduced a compact-disk, read-only memory-based data storage and retrieval system called Opti/Search.

- In December 1986 EDS purchased exclusive rights to CARS 36, DYATRON's automobile dealership software product.

- In August 1986 EDS acquired the rights to Anacomp's CIS retail banking software product in exchange for undisclosed cash payments and expense reimbursements.

- In late 1986 EDS acquired the Information Management Services Division (Rapidata Division) of National Data Corporation (NDC). Terms of the purchase were not disclosed.

  - The division, created during fiscal 1982 in connection with NDC's acquisition of Rapidata, Inc., provides interactive remote computing, data base, and microcomputer-based processing services primarily for financial planning, banking, money, investment management, and marketing applications.

  - According to NDC financials, revenue from this business segment was approximately $11.6 million, $18.1 million, and $23.2 million for fiscal 1986, 1985, and 1984, respectively.

- International computer-services-related acquisitions include:

  - Unilever Computer Services Ltd. (UCSL) of Britain, a provider of facilities management and specialized computer services, was acquired in December 1984 as part of EDS's FM contract with Unilever.

  - RSV Data of Holland was acquired in 1984.

  - Societe Pour L'Informatique (SPI), a wholly owned software and services unit of Pechiney, was acquired in December 1986. SPI added nearly 600 employees to EDS's French base.

Major competitors of EDS are:

- Insurance claims processing: Computer Sciences Corporation (CSC), The Computer Company, McDonnell Douglas Information Systems Group, and Unisys (System Development Corporation)

- Hospital systems: Shared Medical, McDonnell Douglas Information Systems Group, HBO, and Technicon

- Government systems: CSC, Unisys, Planning Research Corporation, and Boeing Computer Services

- Banking services: Automatic Data Processing, Systematics, and Anacomp

- Credit unions: Control Data's Business Information Services and Citicorp

- Remote computing services: Boeing Computer Services, Martin Marietta, CSC, and GEISCO

- Systems integration: Scientific Applications International, BDM International, Unisys, and IBM
- Facilities management: CSC and Systematics

Key Products and Services

INPUT estimates 72% of EDS's non-GM systems revenue is derived from its various processing services, 22% from professional services, 5% from turnkey systems, and 1% from software products.

EDS's non-GM services are offered as follows:

- Facilities Management (FM): EDS assumes virtually all of the data processing and communications requirements for the customer over a multiyear term. Responsibilities include the design and implementation of business information systems, the staffing of the data processing functions, the development and maintenance of necessary software, and the operation of all computer activities.
- Systems Integration: EDS designs, implements, and installs the appropriate combination of hardware and software integrated into a total system designed to fulfill the processing and communications requirements of an application of the customer.
- Fiscal Agent: EDS is responsible for all data processing functions as well as other administrative duties. These may include processing and paying claims as well as ensuring proper coordination of benefits.
- Professional Services: EDS provides system design, custom/contract programming, consulting, engineering services, education, and training.
- Processing Services: EDS provides data processing services from an EDS data center billed on a predetermined minimum monthly basis, usually based on the number of transactions.

The Government Systems Group provides systems integration services and state-controlled Medicaid/Medicare services, as well as Blue Cross/Blue Shield FM services.

Industry Markets

Approximately 64% of EDS's total 1987 revenue was derived form its parent company, GM, and 1% ($58 million) was derived from interest and other. The remaining 35% ($1,552 million) of total revenue (non-GM systems revenue) was derived approximately as follows:

	Percent of Total Non-GM Revenue
Government	41
Financial and Insurance	38
International/Commercial Communications	19
Other	2
	100

Geographic Markets

Approximately 91% ($3,999 million) of EDS's total 1986 revenue was derived from North American operations. The remaining 9% ($380 million) was derived form international sources.

In terms of EDS's non-GM 1986 revenue, approximately 93% was derived from the U.S. and 7% from international sources. Non-GM international business increased over 85% during 1986.

During 1985 EDS assumed responsibility for GM's information processing operations in 21 countries throughout Europe, Latin America, and the Pacific Basin.

EDS has nearly 6,000 international employees.

Computer Hardware and Software

EDS currently operates 14 major data centers in the U.S. The Information Processing Centers (IPCs) contain 29 acres of raised floor space with an excess of 100 large mainframes operating 250,000 computer terminals. EDS has computers from various manufacturers installed, including IBM, National Advanced Systems (NAS), and Amdahl.

Major EDS IPC locations are as follows:

- Richardson (TX)
- Dallas (TX)
- Plano (TX)
- Sacramento (CA)
- Camp Hill (PA)
- Auburn Hills (MI)
- Warren (MI)
- Washington, D.C. area (Herndon, VA)

COMPANY PROFILE

EQUIFAX INC.

1600 Peachtree Street, N.W.
Atlanta, GA 30309
(404) 885-8000

The Company

The Equifax companies provide information services and other services through four service areas, as follows:

- The Insurance and Special Services area provides insurance underwriting and claims investigations, premium auditing, rate and policy management and agency communications, employment evaluation services, mortgage loan reports and mortgage servicing aids, and residential and commercial energy audits. Information services offered include the following:

- The Consumer Credit Services area is a national credit bureau network providing information for consumer and commercial credit reports, services for the management and collection of accounts receivables, and the detection and prevention of fraud.

- The Marketing Services area through Equifax Marketing Services and Elrick & Lavidge provides marketing-related products and services, including marketing analysis, targeted demographic information, automated application processing, credit prescreening, statistical modeling, project management, and data processing.

- Equifax Canada, through two Canadian affiliates (Acrofax and Equifax Services Ltd.), provides insurance underwriting services and systems, consumer credit reports, automated business credit reports, and accounts collection. Equifax also has a part ownership in Toronto Credits, Ltd., a provider of credit reporting services in Canada.

Equifax's total 1987 revenue reached $670 million, a 6% increase over 1986 revenue of $635.1 million. Net income increased 19%, from $25.6 million in 1986 to $30.6 million in 1987.

As of December 31, 1987, Equifax had 10,767 employees. There are currently approximately 2,722 employees involved with information services, as follows:

Equifax Services, Insurance Systems, and Data Processing	500
CBI	1,727
Acrofax	480
Enercom	15
Total	2,722

Major competitors in credit information processing services include TRW Information Services, Trans Union Credit Information Company, and Chilton Corporation.

Key Products and Services

Approximately 93% of Equifax's 1987 information services revenue was derived from processing services. The remaining 7% was derived from application software products for the insurance, utilities, and banking industries and credit providors.

The Insurance and Special Services sector provides information services to the insurance industry through Equifax Services, Inc., Equifax Insurance Systems, Inc., and Enercom, Inc.

- Insurance-related products produce the largest amount of revenue as a group for Equifax. Equifax has increased its technological capabilities in response to the changing needs of the insurance industry by investing heavily in automated ordering and delivery systems.

The Comprehensive Loss Underwriting Exchange (C.L.U.E.) is a data base exchange between property and casualty insurance companies to provide and have access to prior claim history on individuals, vehicles, or property involving auto accidents and property losses.

- C.L.U.E. reports are provided through the Information Gateway or customer-written interfaces.

The Rate/Price Management Systems (RPM) provides current rate and classification information on a company's book of personal auto business.

Information Gateway System (IGS) provides property and casualty insurance companies with an interface between their mainframe- and micro-based processing systems and the nationwide Equifax electronic information distribution system. IGS is used in conjunction with all of Equifax's decision support products.

The Consumer Credit Services unit provides processing services for consumer credit reporting, collection services, and credit promotion primarily to the banking and finance, retail, and credit brokerage industries through CBI/Equifax and Credit Bureau of Baltimore.

- CBI's Automated Delivery Systems Group provides products that address the credit grantor's on-line requirements for mainframe access to the 142 million consumers on file.

Geographic Markets

Ninety-two percent ($618.5 million) of Equifax's revenue is derived from the U.S. and 8% ($51.5 million) from Canada.

COMPANY PROFILE

FIRST DATA RESOURCES INC.

7301 Pacific Street
Omaha, NE 68114-5497
(402) 399-7000

The Company

First Data Resources Inc. (FDR[R]), founded in 1971, is one of the largest third-party processors of debit and credit card transactions in the U.S. The company also offers services in hospital and physician information systems, Medicaid eligibility verification networks, cash management, telemarketing, cable television billing, and third-party hardware maintenance.

FDR is a wholly owned subsidiary of American Express Travel Related Services (TRS), a division of American Express Company.

Key Products and Services

INPUT estimates over 90% of FDR's 1987 revenue was derived from processing services and software sales and software licenses for its debit and credit card processing system. Less than 10% was derived from third-party maintenance services.

FDR provides various services in the following business areas:

- The Transactions Services Division provides a range of services for the management and automation of debit and credit card activities, including cardholder and merchant accounting, authorization, plastic card production, and security services.
- Government Services provides Medicaid authorization services and provides nine-digit ZIP codes to the U.S. Postal Service (USPS) and commercial users via magnetic tapes, diskettes, and manual lists and through use of the 800 telephone number.
- Cable Systems Services offers advanced management information and subscriber billing systems and services to the cable television industry.
- Cash Management Services offers an on-line system that enables clients within business and industry to collect and consolidate relevant financial and management information from their branch operations.

- Telemarketing Services are provided through WATS Marketing of America, Inc., which offers both inbound and outbound telemarketing programs.

- CardShare Services, Inc. an FDR subsidiary, provides credit card registration, travel reservation services, and various insurance products to issuers that offer them to cardholders as benefits.

Industry Markets

The majority of FDR's 1987 revenue was derived from the banking and finance industry. The remainder was derived from large corporations, the federal government, cable television companies, direct mailers, the health-care industry, the retail industry, and various businesses whose computer systems are maintained by FDR.

Geographic Markets

One hundred percent of FDR's 1987 revenue was derived from the U.S.

The major portion of First Data Resource's centralized processing facilities is located in Omaha.

Processing and service centers are also located in Atlanta; Boston; Los Angeles, San Mateo, and Santa Ana (CA); Denver; Nashville; and London.

COMPANY PROFILE

FIRST FINANCIAL MANAGEMENT CORPORATION

3 Corporate Square
Suite 700
Atlanta, GA 30329

The Company

First Financial Management Corporation provides a range of third-party processing services for the handling of various financial transactions and for the management of customer accounts. The company's primary customers include banks, thrifts, mortgage servicers, and merchants. FFMC also provides data imaging services.

In 1987, First Financial Management Corporation's revenues increased 151% to $175 million and net income expanded 111% to $11.7 million.

FFMC management believes it is the largest provider of processing services to U.S. financial institutions.

FFMC management attributed its recent growth in revenue and net income to the following:

- The majority of revenue growth is attributed to acquisitions. The revenue contribution from current-year acquisitions was $74 million in 1987 (First Data Management Corporation), $10 million in 1986, and $10 million in 1985.

- In addition, the market for third-party processing services for financial institutions has been in a strong growth phase, related in large part to the trend to outside vendors for such services by the banking and savings and loans industries.

Since 1984 FFMC has acquired 20 companies.

FFMC is currently organized into the following principal business units:

- The Financial Services Group includes the following three divisions:

  - The Bank Services Division provides processing services to over 1,300 bank customers in 25 states through 29 data centers.

- The Thrift Services Division provides processing and associated services to approximately 170 thrift institutions in 24 states through data centers in Denver, San Diego, and Wichita.

- The Mortgage Service Division provides mortgage processing services to 85 mortgage servicers in 23 states through its data center located in Atlanta (GA).

- The Data Imaging Services Group provides data imaging services, including computer output micrographics and electronic printing, to over 3,500 customers through processing centers located in 15 states.

- The Merchant Credit Card Services Group provides credit card authorization and financial clearing services to retailers.

COMPANY PROFILE

GE INFORMATION SERVICES

401 North Washington Street
Rockville, MD 20850
(301) 340-4000

The Company

GE Information Services (GEIS) was formed in 1979 as General Electric Information Services Company (GEISCO) to consolidate General Electric Company's (GE) MARK III worldwide interactive and remote batch processing services, originally introduced in 1965 under the MARK I name as the first interactive processing service commercially available in the U.S. The organization unified the U.S. operations handled by GE's Information Services Division with European and Australian operations run by Honeywell. Honeywell retained a 16% interest in GEISCO until January 1972, when GE purchased Honeywell's interest for approximately $70 million.

GEIS currently provides remote computing, inquiry/response, electronic data interchange, and value-added processing and associated support services to over 5,000 clients worldwide, primarily in the manufacturing, banking, telecommunications, international trade, shipping, and retail industries.

INPUT estimates that GEIS's total 1987 revenue was approximately $400 million. GEIS management confirmed that 1987 revenue increased 2% over 1986 and that 1988 revenue growth will be in the double digits.

- GEIS management has stated that over the period from 1983 to 1987 a number of factors have impacted its internally reported revenues. These factors included a change in the basis of reporting revenues for GE Consulting Services and GE Computer Services, which are now separate operations under CSO, and the divestiture of certain operations, including Software International.

- GEIS also states that over the period from 1983 to 1987 its revenues had been impacted by a de-emphasis in supplying clients with computer hardware and a restructuring of its business, replacing timesharing applications with full applications integration services and other new value-added services.

Key Products and Services

INPUT estimates GEIS's 1987 revenue was derived approximately as follows:

Network-based services	85%
Network software services support	5%
Professional services	10%
	100%

GEIS has the MARK III[R] Service as its processing/network services offering. This service is used by over 5,000 clients.

GEIS services are categorized into the following application areas:

- International Banking and Financial Services
- Worldwide Intercompany and Logistics Businesses, including Implementation Services
- Business Systems Products
- Value-Added Network Services
- Consumer Information Services

The Business Systems Products Unit provides products and services for office automation and communications that link geographically dispersed operations.

GEnie[TM] (GE Network for Information Exchange) is an electronic consumer information service for microcomputer end users.

Industry Markets

GEIS's 1987 revenue was derived approximately as follows:

Banking	40%
Manufacturing	32%
Telecommunications	10%
Transportation	10%
Retail	5%
Other	3%
	100%

GEIS currently has a client base of over 5,000 corporations and trade associations, including nearly 64% of the Fortune 500 companies.

Geographic Markets

Approximately 50% of GEIS's 1987 revenue was derived from the U.S. and 50% from international sources.

GEIS products and services are offered through over 60 U.S. offices and offices in 30 countries, with global support and access provided by distributors, affiliates, or private data networks in 40 additional countries.

- U.S. regional offices are located in New York City, Atlanta, Chicago, and San Francisco.
- International offices are located in Australia, Austria, Belgium, Canada, France, Germany, Hong Kong, Ireland, Italy, The Netherlands, Norway, Singapore, Spain, Sweden, Switzerland, and the U.K.

Software Development Centers are located in Rockville (MD), Nashville (TN), Berkeley (CA), and Dublin (Ireland).

GEIS's network provides clients with local dial-up services in 750 cities in more than 30 countries worldwide and is available 24 hours a day, seven days a week, 365 days a year. Coverage is extended to 70 countries by using network gateways to several public data networks.

Computer Hardware and Software

The GEIS network uses over 1,000 processing and communications computers. Over 400 of these are Honeywell PMSDs, used to handle communications. Large-scale IBM and Honeywell processors are concentrated in supercenters in Rockville, Cleveland, and Amsterdam. These consist of:

- Thirteen Honeywell DPS 90/ACOS 1000s and seven Honeywell DPS-8/70s operating under GEIS proprietary software for interactive processing, and 15 Honeywell DPS-8/70s running under GCOS for background remote batch processing
- One IBM 3081, one IBM 3090, and one IBM 4341 for interactive and remote batch processing on the MARK 3000 Service

GEIS's teleprocessing network handles over a quarter million user sessions per day, transmitting over 400 million characters of data in and out of the system per hour.

The network consists of satellite links, microwave links, undersea cables, and 350,000 miles of land lines.

COMPANY PROFILE

IBM INFORMATION NETWORK (INS)

3405 W. Buffalo Avenue
Tampa, FL 33630

The Company

The IBM Information Network is concentrating on three specific business areas: EDI, E-Mail, and interorganizational services (IOS). These have been growing rapidly, more than making up for a declining remote processing services base. IBM is bullish on future growth at INS, looking for 80% growth in 1989.

INS is investing in future technologies, evaluating ISDN, image processing, and FAX interface to their network.

A key strategy at INS is to provide its clients with a single network interface, rather than many. As a part of this service, for example, INS provides a standard link to all appropriate IBM information data bases for its customers.

In January 1988, INS offered the "Quantum Leap" program to 1,000 of its largest clients; INS effectively interconnects all client systems through its own computers and networks, acting as an "enabler" for clients' intercompany transactions and messages, and also as a disaster recovery channel.

- INS currently has 500 field people in the U.S. market, with a ratio of 1.5:1 support to sales.
- INS currently has about $140 million in U.S. revenues (INPUT estimate, 1988) and 1,200 employees.

COMPANY PROFILE

McDONNELL DOUGLAS INFORMATION SYSTEMS COMPANY

P.O. Box 516
St. Louis, MO 63166
(314) 232-0232

The Company

McDonnell Douglas Information Systems Company (formerly McDonnell Douglas Information Systems Group) offers remote computing/network services, software products, professional services, and turnkey systems to over 250,000 government and commercial clients worldwide. The company also manufactures and markets minicomputers and provides maintenance services.

- McDonnell Douglas Information Systems Group was created in April 1984 with the consolidation of three of McDonnell Douglas Corporation's divisions (McDonnell Douglas Automation Company, Microdata Corporation, and Vitek Systems, Inc.) with the newly acquired Tymshare, Inc.

- Since 1985, the group has undergone several reorganizations and has divested certain businesses. The current organization, renamed McDonnell Douglas Information Systems Company in early 1988, offers industry-specific solutions to the federal government and the manufacturing, health-care, insurance, retail, and telecommunications industries, as well as cross-industry products and services, including application development tools; consulting, education, and systems development professional services; remote computing (utility processing) services; and network applications services for electronic mail and electronic data interchange (EDI).

Information Systems Company revenue for 1987 reached $1,242 million, a 4% increase over 1986 revenue of $1,190 million. Operating losses were $42.3 million, compared to losses of $69.7 million in 1986.

McDonnell Douglas management attributes Information Services Company's losses to the following:

- 1987 earnings were adversely affected by $36 million in write-offs of investments in businesses no longer considered strategic.

- Sales in several product lines were lower than anticipated, and an unexpectedly high percentage of total revenue came from sales of relatively low margin products and services.

- Losses in 1987 and 1986 also include charges of $53.2 million and $87.9 million, respectively, related to the amortization of acquisition costs.

- Losses in 1987 were partially offset by a $44.3 million gain from the sale of several investments, including partial ownership in a health maintenance organization and a French computer services firm.

- Corrective action begun in the fourth quarter included a reduction of approximately 4% in the information services work force, elimination of some product lines, and selective reorganization of some businesses.

Information Systems Company's primary competitors, by business area, include the following:

- Health services competitors include HBO & Company, Shared Medical Systems, and TDS Health Care Systems.

- Federal government professional services competitors include Computer Sciences Corporation, Electronic Data Systems, Boeing Computer Services, and Martin Marietta Data Systems.

- UNIGRAPHICS competitors include IBM, Calma (General Electric), Intergraph, Applicon (Schlumberger), and Prime.

- Value-added network competitors fall into two categories, as follows:

  - Other value-added network providers: Telenet, CompuServe, Computer Sciences Corporation, GE Information Services, and IBM Information Network

  - Other packet-switch equipment vendors (private networks): Bolt Beranek and Newman, Telenet, and Northern Telecom

- Diversified services competitors, by product/service area include the following:

  - Telephone industry: Boeing Computer Services, GE Information Services, Electronic Data Systems, and Cincinnati Bell

- Insurance industry: Electronic Data Systems and Policy Management Systems Corporation
- TeleCheck: Telecredit
- Credit card authorizations: National Data Corporation
- Electronic data interchange: Sterling Software, Inc. (ORDERNET) and GE Information Services

Key Products and Services

Approximately 85% ($1,056 million) of Information Systems Company's 1987 revenue was derived from information services and 15% ($185 million) was derived from computer sales and service. A further breakdown of information services revenue follows:

Processing services	50%
- Remote computing (27%)	
- Network services (23%)	
Software products	9%
Professional services	17%
Turnkey systems	24%
	100%

The Health Systems Company contributed an estimated $246 million to 1987 revenue, a 2% decrease from 1986 revenue of $250 million. Approximately 60% of revenue is derived from turnkey systems and 40% from processing services. The company claims that one out of every four hospitals in the U.S. uses one or more of its systems.

McDonnell Douglas Network Systems Company sells public data network communications services and private data network systems. This unit contributed about $187 million to 1987 revenue, a 13% increase over $165 million in 1986.

- TYMNET is McDonnell Douglas' public packet data communications network. Based on intelligent communications processors connected by a network of leased telephone lines, microwave links, and satellite channels, TYMNET provides users with low-cost access to host computer applications from terminals and microcomputers worldwide. TYMNET provides value-added services such as error protection, protocol conversion, and data security.

McDonnell Douglas Diversified Information Systems Company contributed approximately $250 million to 1987 revenue, compared to 1986 revenue of $276 million.

- The Integrated Business Systems Division provides software products, remote computing services, and professional services primarily to the communications, insurance, and manufacturing industries. Cross-industry products and services are also provided.

Manufacturing applications are available for time and attendance, work order tracking, labor reporting, shop floor graphics, distributed numerical control with linkages to material requirements planning, plant maintenance, and distribution.

- GDS is CAD/CAE software that supports architectural design and drafting, civil engineering, structural engineering, and mapping applications. The product line contributed about $25 million to 1987 revenue, compared to $30 million in 1986.

- Other manufacturing software products contributed revenue of $16 million in 1987, compared to $21 million in 1986.

Credit card and check authorization services contributed an estimated $85 million to 1987 revenue, up 20% from $71 million in 1986.

- Credit card authorization services are available 24 hours a day, seven days a week via local call access to TYMNET.

EDI services contributed an estimated $7 million to Information Systems Company's 1987 revenue. The principal EDI service, EDI*Net^{R}, was formally introduced in 1983, although the company has provided logistics data interchange services since 1981. EDI*Net supports mailbox and outdial services, using TDCC, X12, International GTDI, and UCS standards.

Industry Markets

Information Services Company derives its revenue primarily from the health-care, manufacturing, retail, and telecommunications industries. 1987 revenue was derived approximately as follows:

Health care	23%
Manufacturing	16%
Retail	10%
Telephone	6%
Insurance	2%
Architecture, engineering, and construction	2%
Distribution	2%
Federal government	2%
Other government	2%
Cross-industry	35%
	100%

Geographic Markets

Approximately 75% of Information Systems Company's 1987 revenue was derived from the U.S. and 25% was derived from international sources.

The company maintains approximately 600 offices worldwide.

COMPANY PROFILE

MEAD DATA CENTRAL
9393 Springboro Pike
P.O. Box 933
Dayton, OH 45401

The Company

Mead Data Central (MDC) currently provides a series of on-line data base information retrieval services to over 200,000 subscribers worldwide. The services available through MDC include LEXIS®, LEXPAT®, NEXIS®, EXCHANGE™, MEDIS®, APOLIT, and NAARS.

MDC's 1987 revenue was $231.2 million, a 23% increase over 1986 revenue of $187.6 million.

Major competitors by service area include the following:

- LEXIS: West Publishing Company (WESTLAW).
- LEXPAT: No other company supplies full text on patents.
- NEXIS: Dow Jones News Retrieval, DIALOG Information Services, VU/TEST, and BRS.
- EXCHANGE: Dow Jones News Retrieval, Investext (Business Research Corporation).
- MDC management believes that there are no specific competitors for its MEDIS, APOLIT, and NAARS products.

Key Products and Services

Most of MDC's 1987 revenue was derived from on-line data base services, and a small portion was from rental of equipment associated with the data base retrieval services.

MDC's data bases currently hold over 130 billion characters, which are contained in over 36 million documents.

MDC's available on-line data base information retrieval services include the following:

- LEXIS, introduced in 1973, is a full-text legal information retrieval service.

- In March 1983, MDC announced LEXPAT, a new on-line search and retrieval service with full-text research in all patents issued by the U.S. Patent and Trademark Office since 1975.

  - The LEXPAT library contains more than 800,000 patents. New patents, issued on Tuesdays, ordinarily are available in LEXPAT on the following Monday.

  - LEXPAT is available to all LEXIS subscribers at no extra charge.

- NEXIS was introduced in 1980 to provide news and business information retrieval services.

  - Currently NEXIS contains 34 billion characters, representing a full-text of approximately 15 million articles from over 160 publications, including newspapers, magazines, wire services, and newsletters.

- The APOLIT (The Associated Press Political) service was introduced in 1982. APOLIT contains information on election campaigns, political issues, and events relating to past, present, and future elections, including information on statewide referenda and propositions, candidates' positions, national polls, congressional ratings, historical data, and an election calendar.

- The MEDIS service was introduced in 1985 to provide information to the health care industry and medical professionals. MEDIS contains a full-text medical information including the latest medical research developments, diagnosis and treatments, technologies, government regulations, and cost analyses.

MDC makes its services available to subscribers through a range of microcomputers and terminals, including those manufactured by IBM, AT&T, Xerox, DEC, Wang, Rolm, and Apple. Communications software for these microcomputers is priced at $50 for the first copy and $25 for subsequent copies. Volume discounts are available.

MDC also offers an instructional program for its LEXIS and NEXIS subscribers. For NEXIS the training is free. For LEXIS the training is priced at $75 per professional for unlimited initial or advanced training. The maximum one-time instruction charge that could be incurred by a subscribing firm would be $2,250. Any additional training would be at no cost.

MDC derives its revenues from a wide variety of subscribers, including law firms, corporations, government agencies and courts, publishers, broadcasters, banks, management consultants, public relations and advertising firms, and law schools.

INPUT estimates that most of MDC's revenue is derived from the U.S. and a small portion is from international sources.

MDC has 50 domestic branch offices in 32 states.

MDC has an international office in Toronto (Canada) and another in London.

MDC has 16 mainframes at its computer center in Dayton.

Clients access MDC's data center via MeadNet, the company's proprietary data communications network, Telenet (U.S. Sprint), TYMNET (McDonnell Douglas), or other telecommunications networks.

- MeadNet supports terminal speeds up to 2,400 bits per second and uses tens of thousands of miles of dedicated, high-speed, leased circuits.
- Local dial-up service is available worldwide.

COMPANY PROFILE

NATIONAL DATA CORPORATION

National Data Plaza
Atlanta, GA 30329
(404) 728-2000

The Company

National Data Corporation (NDC) was incorporated in 1967 in Delaware to provide specialized data processing and facilities management services. The company currently provides various processing services, professional services, turnkey systems, and facilities management primarily in the areas of cash management, credit card authorization and processing, health care, and telemarketing.

NDC is organized into the following divisions/subsidiaries:

- The NDC Credit Card Services Division provides credit card charge authorization, credit card processing, and remittance processing services.
- The NDC Corporate Financial Services Division provides various cash management and reporting processing services.
- The NDC Health Care Data Services Division provides turnkey systems for pharmacy applications. Through NDC Federal Systems, Inc. the company also provides professional services to federal government agencies for health care applications.
- The NDC Telemarketing Services Division provides direct sales and response telemarketing services, market analysis, and locator services to retailers and operator services to the telecommunications industry.
- Communication Response Services, Inc. is a wholly owned subsidiary providing telemarketing services.
- NDC International, Ltd., a wholly owned subsidiary headquartered in London, markets cash management services throughout Western Europe.
- National Data Corporation of Canada, Ltd. markets cash management, credit card, and telemarketing services in Canada. This subsidiary is headquartered in Don Mills, Ontario.

- Technology Sales and Leasing Co., Inc. is an equipment leasing subsidiary.

NDC's principal competitors, by service area, include the following:

- Cash management: Automatic Data Processing, Chemical Bank, and in-house data processing centers.
- Credit card services: First Data Resources and various bank associations.
- Telemarketing: Dial America and regional telephone answering firms.
- Health care: Three PM Inc. (3PM) and PharmAssist.

Key Products and Services

INPUT estimates approximately 80% of NDC's total fiscal 1987 revenue was derived from its various processing services, 11% from professional services, 3% from facilities management, and 6% from turnkey systems.

Services for fiscal 1987 are segmented by NDC as follows ($ thousands):

	Revenue	Percent of Total
Credit Card Services	67,593	47
Corporate Financial Services	33,715	24
Health Care Data Services	25,607	18
Telemarketing Services	15,908	11
	142,823	100

Industry Markets

A majority of NDC's fiscal 1987 revenue was derived from the banking and finance and retail industry sectors. The remainder of revenue was derived from petroleum, medical, airlines, and telephone industry clients and the federal government.

Geographic Markets

Approximately 97% of NDC's fiscal 1987 revenue was derived from the U.S. The remaining 3% was derived from Canada, Japan, and Europe.

U.S. branch offices are located in Ann Arbor, Boston, Cherry Hill (NJ), Charleston (SC), Lombard (IL), Dallas, Fairfield (NJ), Los Angeles, Miami, New York City, Reno (NV), Rockville (MD), San Antonio, San Francisco, and Tulsa.

Foreign offices are located in England, Germany, Italy, Japan, and Toronto (Canada).

Computer Hardware and Software

NDC operates the following equipment:

- At its headquarters in Atlanta and in regional communications centers located in Cherry Hill (NJ), Lombard (IL), Boston, Miami, Reno, and Toronto:

  - 1 Sperry 1100/70, OS 1100
  - 1 Sperry 1100/83, Exec 8
  - 4 DEC PDP-11/70s, 1A5

- At NDC Federal Systems' Rockville data center.

  - 1 Harris 300, Virtual Operating System
  - 1 DEC PDP-11/34, MUMPS
  - 1 DEC PDP-11/24, MUMPS
  - 1 Data General 350, AOS, AOS/VS
  - 1 Data General MV/8000, AOS, AOS/VS
  - 1 Burroughs 1955, MCP
  - 1 Altos ACS 8000-12

In addition, NDC installs DEC PDP-11/34s and -11/70s, Data General Eclipse S/130s and S/230s, and Texas Instruments 990-series minicomputers in support of its services.

NDC's communications network uses leased lines, satellite, Telenet, WATS, foreign exchange, Comshare, and GEISCO. Toll-free or local telephone numbers serving 75 major cities are available.

COMPANY PROFILE

NCR DATA SERVICES

1700 South Patterson Boulevard
Dayton, OH 45479
(513) 445-4600

The Company

NCR Data Services, an autonomous division of NCR Corporation's United States Data Processing Group (USDPG), provides processing services to thrift institutions, commercial banks, credit unions, and retail establishments through the use of NCR Data Centers. NCR Data Services also provides computer output microfiche (COM), laser printing, and facilities management services for a variety of industries. NCR Data Services has a user base of over 850 financial institutions and 20 million accounts in the U.S.

NCR Corporation and its subsidiaries develop, manufacture, market, install, and service business information processing systems for worldwide markets. Total NCR corporate revenue in 1987 was over $5.6 billion. NCR Data Services revenue was $140 million in 1987.

Key Products and Services

One hundred percent of NCR Data Services' 1987 revenue was derived from data processing services provided via over 35 data centers throughout the U.S.

- On-line processing is provided to thrift institutions and credit unions.
- On-line and batch processing services are provided to retail stores and commercial banks.
- NCR Data Services customers are usually charged on a per-transaction or per-account basis. A typical contract is for a minimum of three years.

On-line services include the STARCOM Financial System for the thrift industry and Commerial Banks Systems for commercial banks.

Commercial Bank System provides an on-line banking system

designed for commercial bank account processing. The system offers application modules that can be customized to financial institutions' individual needs.

EFT Services provides STARCOM II, a new electronic transfer service offering 24-hour-a-day processing for either shared or proprietary networks. STARCOM II is designed to maintain transaction security, provide network settlement, and generate management and statistical reports.

Information Imaging Systems provides various computer output image processing services, including laser printing, electronic publishing, value-added information distribution, and computer output microfiche. Services are provided to all phases of print production, finishing, distribution, and record storage.

Facility Management Services provides staff, equipment, and operations support for a customer's data center.

Retail Services provides batch processing to retail chains.

Industry Markets

INPUT estimates that thrift institutions generated approximately 60% of NCR Data Services' 1987 revenue, and commercial banks generated 15%. The remaining 25% of revenue is divided among retail distributors and Information Imaging Systems customers.

Geographic Markets

One hundred percent of NCR Data Services' 1987 revenue was derived from the U.S.

Computer Hardware

NCR Data Services currently maintains over 35 data centers in the U.S.

COMPANY PROFILE

SHARED MEDICAL SYSTEMS CORPORATION

51 Valley Stream Parkway
Malvern, PA 19355
(215) 296-6300

The Company

Shared Medical Systems Corporation (SMS) was formed in 1969 to provide information services to the hospital industry. In June 1976 SMS became a publicly held corporation.

SMS is the nation's leading provider of information services to the health care industry.

- The company's products and services are provided to hospitals, clinics, and physician groups for financial, administrative, and patient management applications.
- SMS currently provides remote computing, network, and distributed processing services; application software products; turnkey systems; and various professional services, including proprietary network design, custom programming, and facilities management.

Revenue for 1987 reached $390.7 million, a 4% increase over 1986 revenue of $374.9 million. Net income rose 42%, from $32 million to $45.3 million.

Key Products and Services

INPUT estimates approximately 70% of SMS' 1987 revenue was derived from remote and facilities management processing services, 25% from software and hardware leases from its in-house/distributed processing and turnkey systems, and the remaining 5% from professional services.

SMS' products and services are provided to hospitals, clinics, and physician groups.

- The company's primary market is the approximately 3,200 non-federal acute care hospitals, generally with 100 or more beds, and physician groups.
- SMS currently serves more than 1,200 hospitals and physician group practices.
- There are over 1,000 mainframes and minicomputers running SMS software installed at SMS client locations.

SMS currently provides remote computing, distributed processing, and in-house systems to its hospital clients.

- The Information Systems Center processes data for more than 800 hospital and physician group clients using IBM 3090 computers. There are more than 30,000 terminals attached to the network that connect clients with the Information Systems Center.

SMS services over 400 medical practices representing over 8,000 physicians nationwide.

SMS' local-area network product, HARMONY, facilitates communications within medical complexes and among multiple affiliated institutions in the same geographic area. The product ranges in price from $50,000 to $150,000 and includes workstations, file servers, and peripherals.

Industry Markets

One hundred percent of SMS' 1987 revenue was derived from the medical industry. Acute-care hospitals accounted for the majority, with the remainder from physician group practices and clinics.

Geographic Markets

The majority of SMS' 1987 revenue was derived from the U.S. INPUT estimates less than 5% was derived from international locations.

Computer Hardware

SMS is moving towards a network that is based primarily on satellite transmission. This network will include earth stations at both its Information Systems Center and each client location, with no primary dependence on land lines. Some of the company's clients are currently using this network.

COMPANY PROFILE

SYSTEMATICS, INC.

4001 Rodney Parham Rd.
Little Rock, AR 72212

The Company

Systematics, Inc., provides facilities management and disaster recovery processing services, applications software products, consulting professional services, and turnkey systems to the banking and finance industry.

Until 1981, Systematics operated as an unconsolidated, majority-owned (75%) subsidiary of Stephens Inc., an investment banking firm also located in Little Rock. Subsequent to public offerings of Systematic's common stock in fiscal 1982 and 1983, Stephens Inc. currently owns 48.7% of the outstanding shares of Systematics.

Currently, Systematics derives approximately 3.5% of its revenues from processing services provided to affiliates of Stephens.

Systematics' revenue increased 24% in 1987 to $160 million, and net income rose 27% to $13 million.

Management attributes much of the recent strength in company performance to the growth in Systematics systems operation (facilities management) business. During the third quarter of fiscal 1988, the company signed eight new systems operations contracts with aggregate contract values in excess of $75 million. This continues a strong sales trend that began over a year ago.

Approximately three-quarters of Systematics' 1987 revenues was derived from processing services (systems operation), 11% from applications software products, 2% from consulting professional services, and the remainder from equipment sales and leases.

COMPANY PROFILE

TELECREDIT, INC.

1901 Avenue of the Stars
Los Angeles, CA 90067

The Company

Telecredit provides on-line payment services that facilitate the financial exchange between buyers and sellers at the point of sale.

Principal services include credit authorization, credit and debit card processing, and a computerized letter collection service.

Through Light Signatures, Inc. (LSI) Telecredit also provides computerized "signaturizing" of consumer products.

Telecredit's revenues increased 14% in 1987 to $136 million, and net income rose by 62% to $13.5 million.

Approximately 93% of Telecredit's revenues in 1987 was derived from payment processing services. The remaining 7% was derived from Light Signature services, interest, equipment rentals, patent licensing, and gains on sales of assets.

Management attributes the strength of its financial performance to improvements in market share in the check services market, service enhancements, a continuation of a favorable growth trend in the check services market, and improvements in operating efficiencies.

Telecredit is principally engaged in providing payment services through a national on-line telecommunications network and computerized data bases. Authorization of check, credit card, and debit card transactions is available either by telephone, point-of-sale terminals, or electronic cash registers.

COMPANY PROFILE

TELERATE, INC.

One World Trade Center
New York, NY 10048

The Company

Telerate, Inc., operates worldwide computerized information systems (the Network) that provide real-time updated financial market data to securities firms, banks, corporations, and other financial institutions, primarily through approximately 70,000 video display screens at subscribers' premises throughout the world.

The Network provides video pages of prices, rates, market data, and news covering major financial markets, including U.S. Treasury and federal agency securities, money market instruments, foreign exchange, U.S. mortgage market securities, precious metals, financial futures and energy, and quotes for publicly traded equity securities, as well as financial news services and market commentary and analysis. The Network also offers services provided by third parties, including quotes for publicly traded equity securities from Quotron, Standard & Poor's Municipal Bond Service, and the Dow Jones and Bond Buyer newswires.

During 1987, Dow Jones & Company, Inc., increased its ownership in Telerate to 56% and, as a result, now includes Telerate's financial results in its accounts on a consolidated basis.

Telerate, Inc., generated approximately $336 million in revenues in 1987, which was 45% above 1986 revenues. Net income was $75 million, representing an 74% increase over 1986 results.

Telerate management attributes its revenue increases primarily to increases in the number of terminals worldwide, as well as to increased sales of optional services and equipment. To a lesser extent, revenue increases were attributed to the passage of increased communication tariffs in North America.

During 1987 Telerate entered into the following agreements:

- In October 1987, Telerate formed a partnership with American Telephone and Telegraph Company to develop and market electronic transaction services for global financial markets. This partnership will provide a system enabling traders to manage transactions instantaneously and with greater control and flexibility than is presently possible. The service, still under development, will initially be targeted to foreign exchange dealers.

- In June 1987, Telerate entered into an agreement with Lotus Development Corporation to produce software that will allow Lotus 1-2-3® users to access Telerate's real-time fixed income and foreign exchange information from within their spreadsheets. The product is scheduled for commercial availability during 1988.

Telerate's major competition comes from Reuters Limited.

COMPANY PROFILE

TRW INFORMATION SERVICES

505 City Parkway West
Orange, CA 92668
(714) 385-7000

The Company

TRW Information Services Division (ISD), formed in 1969, provides consumer credit, business credit, and marketing information through a nationwide on-line inquiry/response system and other computerized services. ISD is a division of the TRW Information Systems Group, a part of TRW, Inc.

ISD is composed of three business segments, as follows:

- TRW Credit Data was formed in November 1969 when TRW acquired the Detroit-based Credit Data Corporation. Credit Data Corporation, founded in 1932, installed the first on-line consumer credit reporting system in 1965.

- TRW Business Credit Services was formed after ISD completed a two-year study of the business credit reporting market. The service went on-line in 1976. TRW expanded this unit's product line to include business-to-business direct marketing services, referred to as TRW Business Information Services.

- TRW Target Marketing Services (formerly TRW Direct Marketing Services) was formed in 1986 in order to further leverage the information in the TRW consumer credit data base. The unit provides direct marketing products and services to business-to-consumer direct marketers.

INPUT estimates ISD's 1987 revenue reached $141 million, a 13% increase over estimated 1986 revenue of $125 million. INPUT estimates that ISD's 1988 revenue will reach $160 million. A five-year summary of estimated revenue follows:

TRW INFORMATION SERVICES
FIVE-YEAR ESTIMATED REVENUE SUMMARY
($ millions)

	FISCAL YEAR				
ITEM	1987	1986	1985	1984	1983
Total Revenue	$141.0	$125.0	$110.0	$100.0	$90.0
• Percent increase from previous year	13%	14%	10%	11%	25%

The division has grown over the last two years through the opening of new offices and the acquisition of other credit bureaus. Recent acquisitions include:

- In the fall of 1987, ISD acquired Executive Services of Richardson (TX). Executive Services provided direct marketing services, including computerized direct mail, mail lists, and demographics.

- In April 1988, ISD acquired the Credit Bureau of Salt Lake City, a provider of credit information services with offices in Wyoming and Utah.

- In April 1988, ISD also acquired South Carolina CreditData Corporation, a provider of credit reporting and consumer/business accounts receiveable management services in Columbia (SC). The consumer credit reporting portion of CreditData's business was incorporated into ISD's credit reporting.

In general, the division competes with information providers in the credit and direct marketing industries, including credit bureaus, mailing list compilers, and computer services companies.

- TRW Credit Data's major competitors are TransUnion Credit Information Company; Credit Bureau Inc., a subsidiary of Equifax; Associated Credit Services Inc., a unit of Computer Sciences Corporation; and Chilton Corporation.

- TRW Business Credit Services competes with Dun & Bradstreet Credit Services, a unit of Dun & Bradstreet Business Information Services.

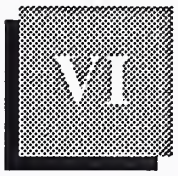
- TRW announced its intention to acquire Chilton from Borg-Warner Corporation in April 1988. The agreement is currently undergoing Justice Department approval, which is customary for this type of acquisition.

Key Products and Services

ISD derives virtually 100% of its revenue from on-line inquiry/response services related to consumer and business credit information and marketing services.

TRW Credit Data is one of the largest vendors of on-line consumer credit information, with more than 143 million consumers on file and 25,000 subscribers at 62,700 locations. Credit histories are accessed by banks, savings and loans, oil companies, retailers, finance companies, insurance companies, and other credit grantors.

Opportunities and Recommendations



Opportunities and Recommendations

A Opportunities

Despite the relatively slow growth of 12% in the processing services sector, Exhibit VI-1 shows that new opportunities do exist in this market, as well as in the faster-growing network services sector.

1. Health Care Legislation

The catastrophic health care bills recently passed by Congress, plus expanded legislation likely in the early 1990s, will create large-scale paperwork systems for medical payments, prescription drug eligibility, hospital reporting systems, etc. Since the medical sector lacks a solid base of experienced in-house staff, processing services vendors can provide these services.

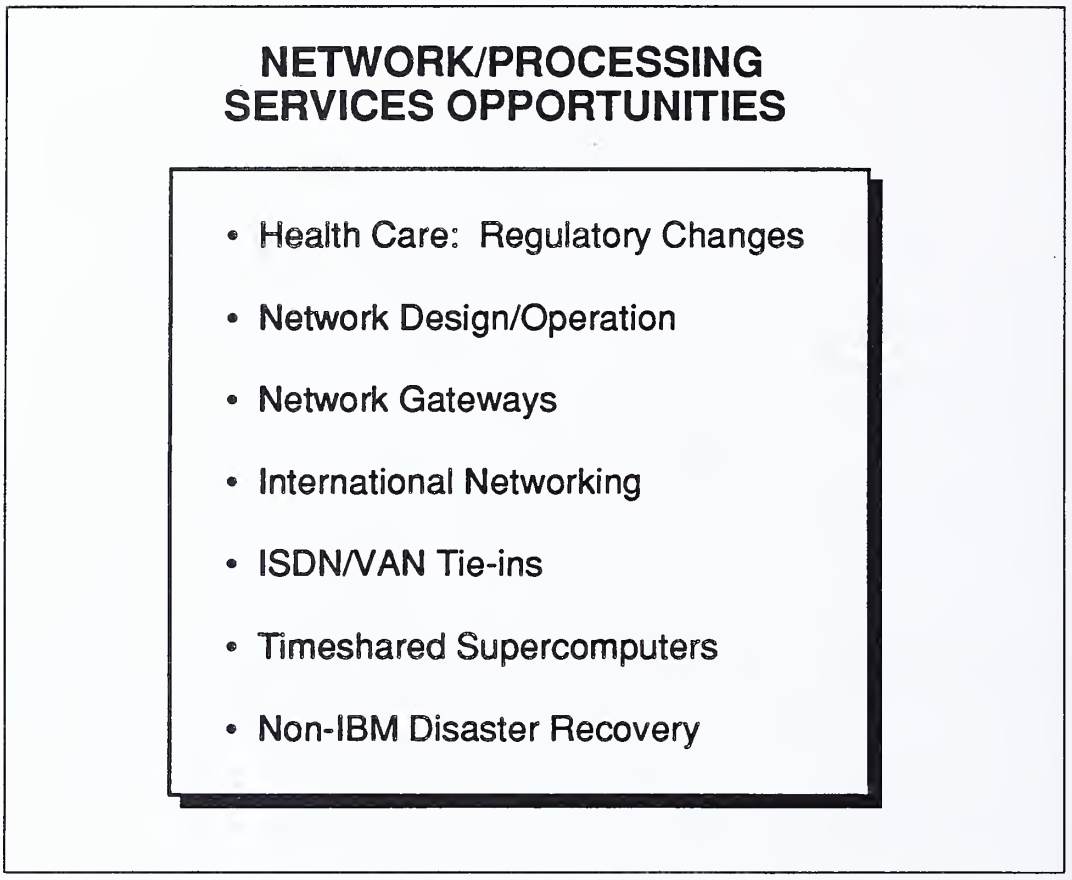
2. Network Design and Operation

Networks will become the backbone linking large numbers of terminals, PCs, data bases, and computers in a worldwide global communications infrastructure in the 1990s. The design, implementation, and operation of those networks is a significant vendor opportunity.

3. Network Gateways

Gateway services, which provide consistent, user-friendly access to data bases and videotex services, will provide potential "account control" for vendors who can build large customer bases through use of these gateways.

EXHIBIT VI-1



4. International Networking Services

International networking services can provide a major opportunity, assuming U.S. firms can enter those markets on a "level playing field" provided by foreign governments, especially in Europe after 1992. There is a risk that a "Fortress Europe" could develop that would make U.S. vendor entry into European markets difficult.

5. ISDN Linkages

Tie-ins between existing value-added networks (VANs) and the emerging ISDN capabilities will allow VAN vendors to leverage their service offerings.

6. Timeshared Supercomputers

Timeshared supercomputers offer an opportunity for large-scale scientific processing services, using "excess" capacity on Cray, CDC, and other supercomputers or on "mini-supers".

7. Non-IBM Disaster Recovery

Non-IBM disaster recovery (primarily Digital and Unisys) can be a growth opportunity, just as SunGard and Comdisco have gained significant revenues from IBM-based systems disaster recovery services.

B

Recommendations to Vendors

To prosper in these competitive markets, vendors will need to move aggressively to protect their existing customer bases and develop presence in specifically targeted new niches. A number of strategies to enhance vendor positions are shown in Exhibit VI-2.

- Vendors need to focus aggressively on specific vertical or cross-industry markets; the narrower the market segment chosen, the better the chances of success in that market (assuming a reasonable market potential exists).

- The ability to provide services that integrate or interconnect physically separate data bases and processors is increasingly important, due to the proliferation of these remote data bases and distributed or departmental systems.

- Vendors should expand the modes of service delivery where appropriate. A processing services application, for example, can also be delivered as a software package or a turnkey system. Professional services such as development of custom software, education and training, and systems operations can expand revenues and cement customer loyalty. Providing a solution via a single delivery mode is an increasingly high-risk strategy. Processing services can provide an "umbrella" under which a mix of products and services are available to a larger population of potential clients.

- Increasingly, customers are buying solutions, not products. To be truly competitive, vendors need to deliver a complete package, answering client needs for pre-sale, installation, and post-sale support; training, education, and consulting; as well as integrated hardware/software products.

- Evaluation of the fast-changing world of communications technology is critical. Vendors can expand their offerings, and separate themselves from the competition, by delivery of solutions and services using the newest communication vehicles.

- A key to success is vendors' understanding, technically, of how their offered services can link to user operations and augment and enhance those operations.

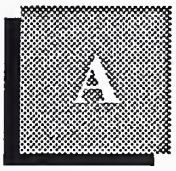
EXHIBIT VI-2

RECOMMENDATIONS TO VENDORS

- Evaluate Role of New Technologies and Applications
- Expand to All Forms of Telecommunication Technology
  - Cellular
  - Fiber Optics
  - Satellites
- Determine How Transmitted Data Can Be Processed
- Develop Gateways to Emerging Communications Services
- Build Relationships with Vendors of Emerging Services
- Understand Technical Requirements for Communication Services
- Develop Strategic Alliances
- Utilize Other Delivery Modes
  - Software Packages
  - Turnkey Systems
  - Customization
  - Education
  - Consulting
  - Systems Integration
- Deliver Distributed Processing and Data Bases
- Seek Specific Market Niches
- Deliver Total Solutions, Not Just Products

- Vendors should determine their areas of potential weakness or exposure. They should then seek alliances to compensate for those areas of technical, product, or sales and marketing-oriented weakness. No single vendor alone can fill all available product/market niches.

Appendix: Definitions



Appendix: Definitions

Appendix A contains the definitions used by INPUT to describe the Information Services Industry.

Appendix B contains the processing/network services user expenditure forecast and data base for 1987-1993.

Information Services - Computer-related services involving one or more of the following:

- Processing of computer-based applications using vendor computers (called "processing services")
- Network-oriented services or functions such as value-added networks, electronic mail, electronic document interchange, on-line data bases, news data bases, videotex
- Products and services that assist users in performing functions on their own computers or vendor computers (called "software products" or "professional services"
- Services that utilize a combination of hardware and software, integrated into a total system (called "turnkey systems" and/or "systems integration"

A
User Expenditures

All user expenditures reported are "available" (i.e., noncaptive, as defined below).

Noncaptive Information Services User Expenditures - Expenditures paid for information services provided by a vendor that is not part of the same parent corporation as the user

Captive Information Services User Expenditures—Expenditures received from users who are part of the same parent corporation as the vendor.

B

Delivery Modes

1. Processing Services

This category includes transaction processing, utility processing, other processing services, and systems operations.

- *Transaction Processing Services* - Updates client-owned data files by entry of specific business activity, such as sales order, inventory receipt, cash disbursement, etc. Transactions may be entered in one of three modes.
  - *Interactive* - Characterized by the interaction of the user with the system, primarily for problem-solving timesharing, but also for data entry and transaction processing; the user is on-line to the program/files. Computer response is usually measured in seconds or fractions of a second.
  - *Remote Batch* - Where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements. Computer response is measured in minutes or hours.
  - *User Site Hardware Services (USHS)* - Those offerings provided by processing services vendors that place programmable hardware at the user's site rather than at the vendor's data center. Some vendors in the federal government market provide this service under the label of distributed data services. USHS offers:
    - Access to a communications network
    - Access through the network to the RCS vendor's larger computers
    - Local management and storage of a data base subset that will service local terminal users via the connection of a data base processor to the network.
    - Significant software as part of the service
  - *Carry-in Batch* - Where users deliver work to a processing services vendor
- *Utility Processing* - Vendor provides access to basic software tools, enabling the users to develop their own problem solutions such as language compilers assemblers, DBMS, sorts scientific library routines, and other systems software.

- *"Other" Processing Services* - Include computer output microfilm, other data output services, data entry services, disaster recovery and backup services.

- *Systems Operations (Processing)* - Also referred to as "resource management," facilities management, or "COCO" (contractor-owned, contractor-operated). Systems control is the management of all or part of a user's data processing functions under a long-term contract of not less than one year. This would include remote computing and batch services. To qualify, the contractor must directly plan, control, operate, and own the facility provided to the user—either onsite, through communications lines, or in a mixed mode.

Processing services are further differentiated as follows:

- *Cross-industry* services involve the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but that cut across industry lines. Most general-ledger, accounts receivable, payroll, and personnel applications fall into this category. General-purpose tools such as financial planning systems, linear regression packages, and other statistical routines are also included. However, when the application, tool, or data base is designed for specific industry use, then the service is industry-specific (see below).

- *Industry-specific* services provide processing for particular functions or problems unique to an industry or industry group. Specialty applications can be either business or scientific in orientation. Examples of industry-specialty applications are seismic data processing, numerically controlled machine tool software development, and demand deposit accounting.

2. Network Services

Network services include a wide variety of network-based functions and operations. Their common thread is that none of these functions could be performed without network involvement. Network services is divided into two major segments: network applications and electronic information systems.

a. Network Applications

The network applications segment is composed of three subsets:

- *Value-Added Networks (VANs)* - VANs typically involve common carrier network transmission facilities that are augmented with computerized switched. These networks have become associated with packet-switching technology because the public VANs that have received the most attention (e.g., Telenet and TYMNET) employ packet-switching

techniques. However, other added data service features, such as store-and-forward message switching, terminal interfacing, error detection and correction, and host computer interfacing, are of equal importance.

- *Electronic Data Interchange (EDI)* - EDI is the application-to-application electronic communications between organizations, based on established business document standards.

- *Electronic Mail (E-Mail)* - Transmission of messages across an electronic mail network managed by a services vendor.

b. Electronic Information Services

Electronic information services are data bases that provide specific terminal-based inquiry such as stock prices, legal precedents, economic indicators, medical diagnosis, airline schedules, current news stories, automobile valuations, etc. Users typically inquire into and extract information from these data bases but do not update them.

3. Software Products

This category includes user purchases of applications and systems software packages for in-house computer systems. Included are lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites.

Expenditures for work performed by organizations other than the package vendor are counted in the category of professional services. Fees for work related to education, consulting, and/or custom modification of software products are counted as professional services, provided such fees are charged separately from the price of the software product itself.

There are several subcategories of software products, as indicated below.

a. Applications Software Products

Applications software products perform functions directly related to solving user's business or organizational need. The products can be:

- *Cross-Industry Products* - Used in multiple-industry applications as well as the federal government sector. Examples are payroll, inventory control, and financial planning.

- *Industry-Specific Products* - Used only in a specific industry sector, such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting, airline scheduling, material resource planning, and insurance claim management.

b. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. These products include:

- *System Control Products* - Function during applications program execution to manage the computer system's resources. Examples include operating systems, communication monitors, emulators, spoolers, network control, library control, windowing, access control.

- *Data Center Management Products* - Used by operations personnel to manage the computer system's resources and personnel more effectively. Examples include performance measurement, job accounting, computer operations scheduling, utilities, capacity management.

- *Applications Development Products* - Used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Examples include traditional programming languages, 4GLs, sorts, productivity aids, assemblers, compilers, data dictionaries, data base management systems, report writers, project control and CASE systems.

4. Turnkey Systems

A turnkey system is an integration of systems and applications software with CPU hardware and peripherals, packaged as a single application (or set of applications) solution. The value added by the vendor is primarily in the software and support. Most CAD/CAM systems and many small-business systems are turnkey systems. This does not include specialized hardware systems such as word processors, cash registers, or process control systems, nor does it include Embedded Computer Resources for military applications. Turnkey systems may be either custom or packaged systems.

- Hardware vendors that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included the appropriate software category.

- Turnkey systems revenue is divided into two categories.

  - *Industry-Specific Systems* - Systems that serve a specific function for a given industry sector, such as automobile dealer parts inventory, medical recordkeeping, or discrete manufacturing control systems

  - *Cross-Industry Systems* - Systems that provide a specific function that is applicable to a wide range of industry sectors, such as financial planning systems, payroll systems, or personnel management systems

- Revenue includes hardware, software, and support functions.

5. Systems Integration (SI)

Systems integration (SI) is the delivery of complex, multidisciplinary multivendor systems, incorporating some or all of these products or services: systems design, programming, integration, equipment, communication networks, installation, education and training, SI-related professional services, and system acceptance. Systems integration contracts typically include custom software, take more than a year to complete, and involve a prime contractor assuming full risk and accepting full responsibility.

6. Professional Services

This category includes consulting, education and training, software development, and systems operations as defined below.

- *Software Development* - Development of a software system on a custom basis. It includes one or more of the following: user requirements definition, system design, contract programming, documentation.
- *Education and Training* - Products and/or services related to information systems and services for the user, including computer-aided instruction (CAI), computer-based education (CBE), and vendor instruction of user personnel in operations, programming, and maintenance.
- *Consulting Services* - Information systems and/or services management consulting, project assistance (technical and/or management), feasibility analyses, and cost-effectiveness trade-off studies.
- *Systems Operations (Professional Services)* - This is a counterpart to systems operations (processing services) except the computing equipment is owned or leased by the client, not by the vendor. The vendor provides the staff to operate, maintain, and manage the client's facility.

C
Equipment/Computer Systems

1. Equipment

Equipment includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system.

- *Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be connected locally to the main processor and generally cannot be included in other categories such as terminals

- *Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters

- *Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters

- *Communication Devices* - Includes modems, encryption equipment, special interfaces, and error control

- *Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories

- *Terminals* - Three types of terminals are described below:

  - *User-Programmable* - Also called intelligent terminals, including:

    - Single-station or standalone
    - Multistation shared processor
    - Teleprinter
    - Remote batch

  - *User Nonprogrammable*

    - Single-station
    - Multistation shared processor
    - Teleprinter

  - *Limited Function* - Originally developed for specific needs, such as point-of-sale (POS), inventory data collection, controlled access, and other applications.

2. Computer Systems

Computer systems include all processors from microcomputers to supercomputers. Computer systems may require type- or model-unique operating software to be functional, but this category excludes applications software and peripheral devices.

- *Microcomputer (Price below $15,000)* - Combines all of the CPU, memory, and peripheral functions of an 8- or 16-bit computer on a chip in the form of:

  - Integrated circuit package
  - Plug-in board with more memory and peripheral circuits
  - Console including keyboard and interfacing connectors
  - Personal computer with at least one external storage device directly addressable by the CPU

- *Workstation (Price between $10,000 and $100,000)* - An integrated multifunctional workstation capable of routine higher-speed communications with mini and mainframe computers and of performing complex local processing. While similar to microcomputers, the workstation typically will have 16- or 32-bit architectures, plus greater graphics and integrated communications capabilities.

- *Minicomputer (Price between $15,000 and $350,000)* - Usually a 16- or 32-bit computer. May represent a portion of a larger system or a complete stand-alone system by itself.

  - Personal business computer
  - Small laboratory computer
  - Nodal computer in a distributed data network, remote data collection network, or connected network, or connected to remote microcomputers

- *Mainframe (Price above $350,000)* - Typically a 32- or 64-bit computer with extensive applications software and a number of peripherals in standalone or multiple-CPU configurations for business (administrative, personnel, and logistics) applications; also called a general-purpose computer.

- *Supercomputer* - High-powered processors with numerical processing throughout that is significantly greater than the fastest general-purpose computers, with capacities in the vicinity of 10-50 million floating point operations per second (MFLOPS). Supercomputers fit in one of two categories:

  - *Real Time* - Generally used for signal processing in military applications.

  - *Non-Real Time* - For scientific use in one of three configurations:

    - Parallel processors
    - Pipeline processor
    - Vector processor

- *Embedded Computer* - Dedicated computer system designed and implemented as an integral part of a weapon, weapon system, or platform; critical to a military or intelligence mission such as command and control, cryptological activities, or intelligence activities. Characterized by military specifications (MIL SPEC) appearance and operation, limited but reprogrammable applications software, and permanent or semipermanent interfaces. May vary in capacity from microcomputers to parallel processor computer systems.

D
Telecommunications

1. Networks

Networks are the electronic interconnections between sites or locations that may incorporate links between central computer sites and remote locations and switching and/or regional data processing nodes. Network services typically are provided on a leased basis by a vendor to move data, voice, video, or textual information between locations. Networks can be categorized in several different ways.

- *Common Carrier Network* - A public access network, such as provided by AT&T, consisting of conventional voice-grade circuits and regular switching facilities accessed through dial-up calling with leased or user-owned modems for transfer rates between 150 and 1200 baud

- *Value-Added Network (VAN)* - (See listing under Section B.2, Delivery Modes.)

- *Local Area Network (LAN)* - Limited-access network between computing resources in a relatively small (but not necessarily contiguous) area, such as a building, complex of buildings, or buildings distributed within a metropolitan area. Uses one of two signaling methods.

  - *Baseband* - Signaling using digital waveforms on a single frequency band, usually at voice frequencies and bandwidth, and limited to a single sender at any given moment. When used for local-area networks, typically implemented with TDM to permit multiple access.

  - *Broadband* - Transmission facilities that use frequencies greater than normal voice-grade, supported in local-area networks with RF modems and AC signaling. Also known as wideband. Employs multiplexing techniques that increase carrier frequency between terminals to provide:

    - Multiple (simultaneous) channels via FDM (Frequency Division Multiplexing)

    - Multiple (time-sequenced) channels via TDM (Time Division Multiplexing)

    - High-speed data transfer rate via parallel mode at rates of up to 96,000 baud (or higher, depending on media)

2. Transmission Facilities

Transmission facilities include wire, carrier, coaxial cable, microwave, optical fiber, satellites, cellular radio, and marine cable operating in one of two modes, depending on the vendor and the distribution of the network.

- *Mode* - may be either:
  - *Analog* - Transmission or signal with continuous-waveform representation, typified by AT&T's predominantly voice-grade DDD network and most telephone operating company distribution systems
  - *Digital* - Transmission or signal using discontinuous, discrete quantities to represent data, which may be voice, data, record, video, or text, in binary form
- *Media* - May be any of the following:
  - *Wire* - Varies from earlier single-line teletype networks, to two-wire standard telephone (twisted pair), to four-wire full- duplex balanced lines
  - *Carrier* - A wave, pulse train, or other signal suitable for modulation by an information-bearing signal to be transmitted over a communications system, used in multiplexing applications to increase network capacity
  - *Coaxial Cable* - A cable used in HF (high-frequency) and VHF (very high frequency), single-frequency, or carrier-based systems; requires frequent reamplification (repeaters) to carry the signal any distance
  - *Microwave* - UHF (ultra-high-frequency) multichannel, point-to-point, repeated radio transmission; also capable of wide frequency channels
  - *Optical Fiber* - Local signal distribution systems employed in limited areas, using light-transmitting glass fibers and TDM for multichannel applications
  - *Communications Satellites* - Synchronous earth-orbiting systems that provide point-to-point, two-way service over significant distances without intermediate amplification (repeaters), but requiring suitable groundstation facilities for up- and down-link operation
  - *Cellular Radio* - Network of fixed, low-powered two-way radios that are linked by a computer system to track mobile phone/data set units. Each radio serves a small area called a cell. The computer switches service connections to the mobile unit from cell to cell.

E

Other Considerations

When questions arise about the proper place to count certain user expenditures, INPUT addresses them from the user's viewpoint. Expenditures are then categorized according to what users perceive they are buying.

The standard industrial classification (SIC) codes are used to define the economic activity contained in generic sectors such as process manufacturing, insurance, or transportation.

The specific industries (and their SIC codes) included under these generic industry sectors are detailed in the exhibit.

EXHIBIT A-1

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Discrete Manufacturing	23	Apparel
	25	Furniture
	27	Printing
	31	Leather
	34	Metal
	35	Machinery
	36	Electronics
	37	Transportation
	38	Scientific and Control Instruments
	39	Miscellaneous
Process Manufacturing	10	Metal Mining
	11	Anthracite Mining
	12	Coal Mining
	13	Oil and Gas Extraction
	14	Mining/Quarrying of Non-Metallic Minerals, except Fuels
	20	Food Products
	21	Tobacco
	22	Textile Products
	24	Lumber and Wood Products
	26	Paper Products
	28	Chemicals
	29	Petroleum
	30	Rubber and Plastics
	32	Stone, Glass, Clay
	33	Primary Metals
Transportation	40	Railroads
	41	Local Transit
	42	Motor Freight
	43	U.S. Postal Service
	44	Water Transportation
	45	Air
	46	Pipelines
	47	Transportation Services

EXHIBIT A-1 (Cont.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Utilities	49	Electric, Gas, and Sanitary
Communications	48	Communications
Wholesale Distribution	50	Durable Goods
	51	Nondurable Goods
Retail Distribution	52	Building Materials, Hardware
	53	General Merchandise
	54	Food
	55	Automotive and Gas Stations
	56	Apparel
	57	Furniture
	58	Eating and Drinking
	59	Miscellaneous Retail
Banking and Finance	60	Banks
	61	Credit Agencies
	62	Security and Commodity Brokers
	67	Holding and Investment Offices
Insurance	63	Insurance (Life, Health, Etc.)
	64	Insurance Agents
Medical	80	Health Services
Education	82	Educational Services

EXHIBIT A-1 (Cont.)

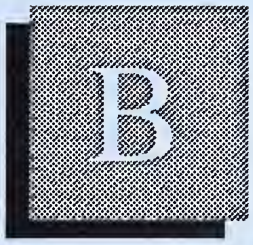
INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Utilities	49	Electric, Gas, and Sanitary
Communications	48	Communications
Wholesale Distribution	50	Durable Goods
	51	Nondurable Goods
Retail Distribution	52	Building Materials, Hardware
	53	General Merchandise
	54	Food
	55	Automotive and Gas Stations
	56	Apparel
	57	Furniture
	58	Eating and Drinking
	59	Miscellaneous Retail
Banking and Finance	60	Banks
	61	Credit Agencies
	62	Security and Commodity Brokers
	67	Holding and Investment Offices
Insurance	63	Insurance (Life, Health, Etc.)
	64	Insurance Agents
Medical	80	Health Services
Education	82	Educational Services

EXHIBIT A-1 (Cont.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Services	72	Personal Services
	73	Business Services (Excluding Information Services Companies Themselves)
	89	Miscellaneous Services
	66	Combinations of Real Estate, Insurance, Loans, Law Offices
	81	Legal Services
	76	Miscellaneous Repair
Federal Government	N/A	As Appropriate
State and Local Government	N/A	As Appropriate
Other Industries	01-09	Agriculture, Forestry, and Fishing
	15-17	Construction
	70	Hotels, Rooming Houses, Camps, and Other Lodging Places
	75	Automotive Repair, Services, and Garages
	78	Motion Pictures
	79	Amusement and Recreation Services, except Motion Pictures
	83	Social Services
	84	Museums, Art Galleries, Botanical and Zoological Gardens
	86	Membership Organizations



Appendix: Market Forecast Data Base, 1988-1993

PROCESSING SERVICES USER EXPENDITURE FORECAST BY SECTOR, 1988-1993

Industry Sector	$ Millions							CAGR (%) 1988-1993
	1987	1988	1989	1990	1991	1992	1993	
Discrete Manufacturing	683	753	851	961	1,076	1,201	1,340	12
Process Manufacturing	888	1,017	1,155	1,313	1,477	1,660	1,862	13
Transportation	1,389	1,558	1,792	2,061	2,347	2,667	3,027	14
Utilities	77	86	96	107	120	133	148	12
Telecommunications	488	558	648	752	864	992	1,137	15
Wholesale Distribution	307	331	364	401	437	477	519	9
Retail Distribution	109	125	142	162	183	206	231	13
Banking and Finance	3,266	3,789	4,344	4,981	5,672	6,449	7,327	14
Insurance	730	823	939	1,071	1,217	1,381	1,566	14
Medical	899	1,032	1,167	1,320	1,486	1,671	1,877	13
Education	228	237	248	260	271	282	292	4
Services	600	678	732	789	842	897	955	7
Federal Government	623	650	695	743	791	841	905	7
State & Local Government	648	734	854	994	1,153	1,336	1,547	16
Other Industry Specific	541	595	666	746	826	914	1,010	11
Total Vertical Markets	11,477	12,965	14,694	16,660	18,762	21,105	23,743	13

Continued

PROCESSING SERVICES USER EXPENDITURE FORECAST BY SECTOR, 1988-1993

Cross-Industry Sector	$ Millions							CAGR (%) 1988-1993
	1987	1988	1989	1990	1991	1992	1993	
Cross-Industry Sector								
Accounting	952	991	1,028	1,067	1,096	1,124	1,151	3
Education and Training	88	91	95	99	103	107	110	4
Engineering and Scientific	112	115	120	126	131	136	140	4
Human Resources	988	1,195	1,363	1,529	1,697	1,898	2,121	12
Office Systems	43	42	40	39	37	36	34	-4
Planning and Analysis	222	217	210	203	194	185	177	-4
Other Cross-Industry Specific	378	431	500	580	666	763	873	15
Total Cross-Industry Markets	2,782	3,081	3,357	3,644	3,925	4,248	4,607	8
Other Cross-Industry								
Utility Processing	1,087	1,159	1,236	1,298	1,324	1,324	1,324	3
Other Processing	1,359	1,567	1,807	2,083	2,375	2,708	3,087	15
System Operations	76	79	82	86	89	92	96	4
Total Other Cross-Industry	2,522	2,805	3,125	3,467	3,788	4,124	4,507	10
Total Information Services Industry	16,781	18,851	21,176	23,771	26,475	29,478	32,856	12

TRANSACTION PROCESSING USER EXPENDITURE FORECAST BY SECTOR, 1988-1993

Industry Sector	$ Millions							CAGR (%) 1988-1993
	1987	1988	1989	1990	1991	1992	1993	
Discrete Manufacturing	619	680	768	868	970	1,082	1,206	12
Process Manufacturing	831	956	1,089	1,241	1,401	1,577	1,773	13
Transportation	1,355	1,518	1,745	2,007	2,284	2,595	2,943	14
Utilities	51	56	62	69	76	83	91	10
Telecommunications	460	525	608	706	811	929	1,063	15
Retail Distribution	105	121	138	157	177	199	224	13
Wholesale Distribution	255	273	300	330	359	389	422	9
Banking and Finance	2,249	2,586	2,947	3,359	3,790	4,266	4,797	13
Insurance	248	277	316	360	406	457	514	13
Medical	425	476	533	597	661	731	807	11
Education	160	164	172	180	187	194	201	4
Services	592	668	721	778	830	885	941	7
Federal Government	332	335	358	382	404	427	450	6
State & Local Government	156	187	219	256	297	343	396	16
Other Industry Specific	527	580	649	727	805	890	983	11
Total Vertical Markets	8,365	9,403	10,626	12,016	13,458	15,048	16,811	12

Continued

EXHIBIT B-2 (Cont.)

TRANSACTION PROCESSING, USER EXPENDITURE FORECAST BY SECTOR, 1988-1993

Industry Sector	$ Millions							CAGR (%) 1988-1993
	1987	1988	1989	1990	1991	1992	1993	
Cross-Industry Sector								
Accounting	952	991	1,028	1,067	1,096	1,124	1,151	3
Education and Training	88	91	95	99	103	107	110	4
Engineering and Scientific	112	115	120	126	131	136	140	4
Human Resources	988	1,195	1,363	1,529	1,697	1,898	2,121	12
Office Systems	43	42	40	39	37	36	34	-4
Planning and Analysis	222	217	210	203	194	185	177	-4
Other Cross-Industry Specific	378	431	500	580	666	763	873	15
Total Cross-Industry Markets	2,782	3,081	3,357	3,644	3,925	4,248	4,607	8
Total Information Services Industry	11,147	12,484	13,983	15,660	17,383	19,296	21,418	11

SYSTEMS OPERATIONS USER EXPENDITURE FORECAST BY SECTOR, 1988-1993

Industry Sector	$ Millions							CAGR (%) 1988-1993
	1987	1988	1989	1990	1991	1992	1993	
Discrete Manufacturing	64	73	83	93	105	119	134	13
Process Manufacturing	57	61	66	71	77	83	89	8
Transportation	34	40	46	54	63	72	84	16
Utilities	26	29	34	38	44	50	57	14
Telecommunications	28	34	39	46	54	63	74	17
Retail Distribution	4	4	5	5	6	7	7	12
Wholesale Distribution	52	58	64	71	79	87	97	11
Banking and Finance	1,017	1,202	1,397	1,622	1,882	2,183	2,530	16
Insurance	483	546	623	711	811	923	1,052	14
Medical	474	556	634	724	825	940	1,070	14
Education	68	73	76	80	84	88	92	5
Services	8	10	11	11	12	13	13	6
Federal Government	292	315	337	361	387	414	455	8
State & Local Government	492	547	635	738	856	993	1,151	16
Other Industry Specific	13	15	17	19	21	24	26	12
Total Vertical Markets	3,112	3,562	4,067	4,644	5,304	6,058	6,931	14
Total Cross-Industry Markets	76	79	82	86	89	92	96	1
Total Information Services Industry	3,188	3,641	4,150	4,730	5,393	6,150	7,027	14

NETWORK/ELECTRONIC INFORMATION SERVICES USER EXPENDITURE FORECAST BY SECTOR, 1988-1993

Industry Sector	$ Millions							CAGR (%) 1988-1993
	1987	1988	1989	1990	1991	1992	1993	
Discrete Manufacturing	38	46	61	78	101	130	162	29
Process Manufacturing	547	649	793	948	1,129	1,338	1,577	19
Transportation	86	109	148	197	263	353	476	34
Utilities	53	66	82	102	126	154	189	24
Telecommunications	32	42	57	76	100	132	172	32
Wholesale Distribution	109	137	191	265	370	521	738	40
Retail Distribution	70	92	126	170	231	313	424	36
Banking and Finance	357	476	621	794	1,010	1,279	1,608	28
Insurance	107	126	152	179	210	245	285	18
Medical	316	393	512	655	837	1,067	1,356	28
Education	99	116	142	172	207	248	296	21
Services	307	373	463	561	676	807	954	21
Federal Government	675	853	943	1,033	1,137	1,250	1,376	10
State & Local Government	37	47	60	75	95	119	149	26
Other Industry Specific	55	62	82	108	143	191	256	33
Total Vertical Markets	2,887	3,586	4,433	5,413	6,632	8,147	10,018	23

Continued

EXHIBIT B-4 (Cont.)

NETWORK/ELECTRONIC INFORMATION SERVICES
USER EXPENDITURE FORECAST
BY SECTOR, 1988-1993

Cross-Industry Sector	$ Millions							CAGR (%) 1988-1993
	1987	1988	1989	1990	1991	1992	1993	
Securities	602	762	968	1,197	1,473	1,797	2,166	23
Credit	702	861	1,058	1,266	1,507	1,778	2,072	19
Text/Bibliography	130	166	213	266	329	405	493	24
News	451	590	774	989	1,257	1,582	1,968	27
Economic/Other	151	186	231	278	334	397	467	20
Total Cross-Industry Markets	2,036	2,566	3,244	3,997	4,900	9,959	7,165	23
Total Information Services Industry	4,923	6,152	7,677	9,410	11,532	14,106	17,183	23

NETWORK APPLICATIONS USER EXPENDITURE FORECAST BY SECTOR, 1988-1993

Industry Sector	$ Millions							CAGR (%) 1988-1993
	1987	1988	1989	1990	1991	1992	1993	
Discrete Manufacturing	18	21	29	39	53	72	92	34
Process Manufacturing	35	43	61	85	119	167	235	40
Transportation	15	20	32	50	78	122	191	57
Utilities	23	28	36	46	59	75	95	28
Telecommunications	7	8	12	17	23	33	46	40
Retail Distribution	20	24	36	55	83	125	189	51
Wholesale Distribution	77	99	145	212	308	448	654	46
Banking and Finance	56	73	101	140	193	266	368	38
Insurance	7	8	12	17	23	33	46	40
Medical	116	145	197	265	357	482	651	35
Education	39	44	55	69	85	106	132	24
Services	6	7	10	14	19	26	36	37
Federal Government	489	613	682	758	847	949	1,067	12
State & Local Government	18	22	29	39	51	68	90	33
Other Industry Specific	35	39	54	76	107	150	211	40
Total Vertical Markets	958	1,195	1,492	1,881	2,405	3,121	4,104	28
Total Information Services Industry	958	1,195	1,492	1,881	2,405	3,121	4,104	28

ELECTRONIC INFORMATION SERVICES
USER EXPENDITURE FORECAST
BY SECTOR, 1988-1993

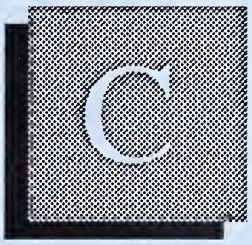
Industry-Specific Data Bases	$ Millions							CAGR (%) 1988-1993
	1987	1988	1989	1990	1991	1992	1993	
Discrete Manufacturing	20	25	32	39	48	58	70	23
Process Manufacturing	513	607	733	863	1,010	1,171	1,342	17
Transportation	70	89	116	147	185	231	285	26
Utilities	30	37	46	56	67	80	93	20
Telecommunications	25	34	45	59	77	99	126	30
Retail Distribution	50	68	90	115	148	188	235	28
Wholesale Distribution	32	38	46	54	63	73	84	17
Banking and Finance	301	403	520	654	817	1,013	1,240	25
Insurance	100	118	140	162	186	212	239	15
Medical	201	248	315	390	479	585	704	23
Education	60	71	87	103	122	143	165	18
Services	301	366	453	547	657	781	918	20
Federal Government	187	240	261	276	289	301	308	5
State & Local Government	19	25	31	37	44	51	59	18
Other Industry Specific	20	23	27	31	36	40	45	14
Total Vertical Markets	1,929	2,391	2,942	3,532	4,227	5,026	5,914	20

Continued

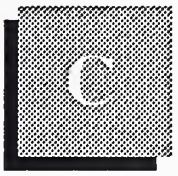
EXHIBIT B-6 (Cont.)

ELECTRONIC INFORMATION SERVICES USER EXPENDITURE FORECAST BY SECTOR, 1988-1993

Cross-Industry Data Bases	$ Millions							CAGR (%) 1988-1993
	1987	1988	1989	1990	1991	1992	1993	
Cross-Industry Data Bases								
Securities	602	762	968	1,197	1,473	1,797	2,166	23
Credit	702	861	1,058	1,266	1,507	1,778	2,072	19
Text/Bibliography	130	166	213	266	329	405	493	24
News	451	590	774	989	1,257	1,582	1,968	27
Economic/Other	151	186	231	278	334	397	467	20
Total Cross-Industry Markets	2,036	2,566	3,244	3,997	4,900	5,959	7,165	23
Total Information Services Industry	3,965	4,957	6,186	7,529	9,127	10,988	13,079	21



Appendix: Data Base Reconciliation, 1987-1988



Appendix: Data Base Reconciliation, 1987-1988

Reconciliation is complicated by the separation of the processing/network services market into two delivery modes in 1988 and by the restructuring of submodes within each sector. In some of the new submodes, direct comparisons are not possible. The exhibit does compare all equivalent submodes as well as the two primary markets, processing and network services. Exhibit C-1 contains the detailed reconciliation.

The major variance is in the utility processing services sector, where INPUT has reduced market size and growth rates.

INPUT believes this market had been overstated, while both "transaction" and "other" processing services (including disaster recovery and computer output microfilm services) had been understated in prior reports. Revenues previously classified as "utility" have been moved to the other two sectors of this market.

Systems operations is now projected to have a 14% growth rates for the period 1988-1993, up from 12% forecast in 1987. INPUT expects the burgeoning systems integration (SI) market to stimulate the demand for a systems operations approach to complex solutions delivered under SI contracts.

Network services growth rates for the period 1988-1993 are raised 3% in the 1988 forecast, to 23%. INPUT found a faster 1987-1988 growth than originally anticipated. Finally, INPUT identified a number of sources for electronic information services revenues, associated with specific vendors of structured and unstructured data bases, than were previously reported.

EDI and E-mail revenues and other (videotex) services were not specifically broken out in the 1987 report. The identification of revenues in these sectors contributed in part to the increase in 1987 market size (a 14% variance from the prior report) for network services.

The combined processing and network services sectors was forecast in 1987 to grow at 13% CAGR during the next five years; the increase is due primarily to the vitality of data bases, EDI, and systems operations markets.

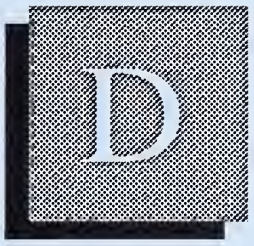
PROCESSING/NETWORK SERVICES DATA BASE RECONCILIATION 1987-1992

Delivery Mode	1987 Market			1992 Market			1987-1992 CAGR Fcst. in 1987 Rpt. (%)	1988-1993 CAGR Fcst. in 1988 Rpt. (%)
	1987 Fcst. ($ M)	1988 Rpt. ($ M)	Variance as Percent of 1988 Rpt.	1987 Fcst. ($ M)	1988 Rpt. ($ M)	Variance as Percent of 1988 Fcst.		
Processing Services	16,549	16,781	1	27,734	29,478	11	11	12
- Remote Batch/Interactive	13,403	13,593	0	22,169	23,328	5	11	11
- Transaction Processing	-	11,147	-	-	19,296	-	-	11
- Other Processing	-	1,359	-	-	2,708	-	-	15
- Utility Processing	2,410	1,087	(55)	3,324	1,324	(60)	7	3
- Systems Operations (Facilities Management)	3,146	3,188	0	5,565	6,150	5	12	14

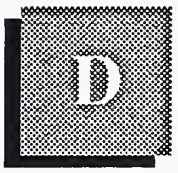
Continued

PROCESSING/NETWORK SERVICES DATA BASE RECONCILIATION 1987-1992

Delivery Mode	1987 Market			1992 Market			1987-1992 CAGR Fcst. in 1987 Rpt. (%)	1988-1993 CAGR Fcst. in 1988 Rpt. (%)
	1987 Fcst. ($ M)	1988 Rpt. ($ M)	Variance as Percent of 1988 Rpt.	1987 Fcst. ($ M)	1988 Rpt. ($ M)	Variance as Percent of 1988 Fcst.		
Network Services	4,311	4,923	14	10,509	14,106	34	20	23
- On-line Data Bases	3,772	3,802	1	8,767	9,117	4	18	19
- News Data Bases	-	502	-	-	1,860	-	-	29
- Other	-	160	-	-	867	-	-	40
- Value-Added Networks	539	539	0	1,742	1,498	14	26	21
- E-Mail	-	291	-	-	518	-	-	11
- EDI	-	127	-	-	1,105	-	-	56
Combined Processing and Network Services	20,860	21,704	4	38,243	43,524	14	13	15



Appendix: Vendor Questionnaire



Appendix: Vendor Questionnaire

I. Company Background Data

Company name: _____

Headquarters address: _____

_____

Respondent Name and Title: _____

CEO Name _____ Headquarters telephone: ( )_____

Number of employees associated with information services activities:

Marketing/Sales	_____
Computer Operations	_____
Research & Development	_____
Customer Support	_____
Finance/Admin.	_____
IS Total	_____
Company Total	_____

Please provide a brief statement of the principal business of your firm.

_____

_____

II. Revenues

1. Please indicate annual revenues for United States, noncaptive information services (revenues from sources outside your own corporate structure).

	Fiscal Year Ending___/86 Mo	Fiscal Year Ending___/87 Mo	Fiscal Year Projection Ending___/88 Mo
Revenues - ($ Millions)	$M	$M	$M
Revenue Growth % From Previous Year: Total	%	%	%
• From price increases	%	%	%
• From acquisition	%	%	%
• From new products	%	%	%
• From sales volume	%	%	%

2. Percent of Noncaptive Prior Year U.S. Revenues from Following Delivery Modes (See Definitions Attached):

Application Software Products _____% Turnkey Systems _____%
Systems Software Products _____% Professional Services _____%
Processing Services _____% Systems Integration _____%
Network and Electronic Information Services _____%

3. Percent of Prior Year's Revenues From:

United States _____% Canada _____% Europe _____% Asia Pacific (Total) _____%
Japan (only) _____% Latin America _____% Other _____%

III. Additional Corporate Information

Year company was incorporated or founded: _____
Ownership: ❑ Public ❑ Private ❑ Owned by another company
If owned by another organization, please indicate legal relationship with parent:
❑ Subsidiary ❑ Division Other: _____

Parent company's name:_____

Subsidiary Operations:

Please provide the following information for all active subsidiaries or divisions owned by your company that are engaged in information services activities.

Name of Company: _____

Headquarters Address: _____

City, State, Zip: _____

President's Name: _____

Telephone Number: ( )_____

On the following pages, please provide additional information for those service delivery modes applicable to your business.

Please send us your product literature for our files and reference use, and add INPUT to your mailing list for press releases and financial reports. Thanks very much for your assistance.

A

Application Software

Please indicate the percentage of your U.S. last year's revenue from application software products. (Total for Section1 should equal 100% of those revenues. Total for Section 2A **plus** 2B should also be 100%.)

Revenue Growth Last Year: _____%

1. Applications Software Products ....._____%

Mainframe ....._____%
- Minicomputer ....._____%
- Workstation/PC ....._____%

100%

2A. Revenues from Vertical Markets
(Based on U.S. Dept. of Commerce SIC Codes)

Discrete Manufacturing _____%
Process Manufacturing _____%
Transportation _____%
Utilities _____%
Telecommunications _____%
Retail Distribution _____%
Wholesale Distribution _____%
Banking and Finance
- Commercial Banks _____%
- Savings/Thrifts _____%
- Brokerage _____%
- Other _____%

Insurance
- Life/Health _____%
- Property/Casualty _____%
- Agency _____%

Medical
- Hospitals _____%
- Physicians/Clinics _____%
- Other _____%

Education _____%
Services (lawyers, accountants, etc.) _____%
Federal Government
- DoD _____%
- Civil _____%

State/Local Government
- State _____%
- Local _____%

Other (construction, non-profit) _____%
Consumer, Home Usage _____%

2B. Revenues from Cross-Industry Markets

Planning/Analysis/ Spreadsheets _____%
Accounting _____%
Education/Training _____%
Human Resources _____%
Engineering/Scientific _____%
Office Systems (Word Processing, E-Mail, Calendar, etc.) _____%
Sales/Marketing _____%
Publishing Systems _____%
Graphics _____%
Other _____%

B

Systems Software Products

Please indicate the percentage of your U.S. last year's revenue from systems software products. (Total for Section 1 should equal 100% of those revenues. Total for Section 2 should also be 100%.)

Revenue Growth Last Year: _____%

1. Systems Software ..... _____%

a. Systems Control ..... _____%
- Mainframe ..... _____%
- Minicomputer ..... _____%
- Workstation/PC ..... _____%

100%

b. Data Center Management Tools ..... _____%
- Mainframe ..... _____%
- Minicomputer ..... _____%
- Workstation/PC ..... _____%

100%

c. Application Development Tools ..... _____%

100%

- Mainframe ..... _____%
- Minicomputer ..... _____%
- Workstation/PC ..... _____%

100%

C

Processing Services

Please indicate the percentage of your U.S. last year's revenue from processing services. (Total for Section 1 should equal 100% of those revenues. Total for Section 2A **plus** 2B should also be 100%.)

Revenue Growth Last Year: _____%

1. Processing Services _____%

a. Remote/interactive ..... _____%
- Transaction Services ..... _____%
- Utility Services ..... _____%
- Other Services ..... _____%

..... 100%

b. Systems Operations (facilities management of vendor-owned systems) ..... _____%

100%

2A. Revenues from Vertical Markets
(Based on U.S. Dept. of Commerce SIC Codes)

Discrete Manufacturing _____%
Process Manufacturing _____%
Transportation _____%
Utilities _____%
Telecommunications _____%
Retail Distribution _____%
Wholesale Distribution _____%
Banking and Finance
- Commercial Banks _____%
- Savings/Thrifts _____%
- Brokerage _____%
- Other _____%
Insurance
- Life/Health _____%
- Property/Casualty _____%
- Agency _____%
Medical
- Hospitals _____%
- Physicians/Clinics _____%
- Other _____%
Education _____%
Services (lawyers, accountants, etc.) _____%
Federal Government
- DoD _____%
- Civil _____%
State/Local Government
- State _____%
- Local _____%
Other (construction, non-profit) _____%
Consumer, Home Usage _____%

2B. Revenues from Cross-Industry Markets

- Utility Services _____%
- Other Services _____%
  Computer Output Microfilm _____%
  Data Entry _____%
  Disaster Recovery _____%
  Carry-In Batch _____%
  All Other _____%

Planning/Analysis/ Spreadsheets _____%
Accounting _____%
Education/Training _____%
Human Resources _____%
Engineering/Scientific _____%
Office Systems (Word Processing, E-Mail, Calendar, etc.) _____%
Sales/Marketing _____%
Publishing Systems _____%
Graphics _____%
Other _____%

D

Network Services

Please indicate the percentage of your U.S. last year's revenue from network services. (Total for Section 1 should equal 100% of those revenues. Totals for Section 2A plus 2B should also be 100%.)

Revenue Growth Last Year: _____%

1. Network Applications ..... _____%
   - -Value-Added Network Services (VANS) ..... _____%
   - - Electronic Mail ..... _____%
   - -Electronic Data Interchange (EDI) ..... _____%

   100%

2. Electronic Information Services (EIS) ..... _____%

   100%

   - - Databases ..... _____%
   - - News ..... _____%
   - - Videotex ..... _____%

   100%

2A. Revenues from Vertical Markets
(Based on U.S. Dept. of Commerce SIC Codes)

Discrete Manufacturing _____%
Process Manufacturing _____%
Transportation _____%
Utilities _____%
Telecommunications _____%
Retail Distribution _____%
Wholesale Distribution _____%
Banking and Finance
- Commercial Banks _____%
- Savings/Thrifts _____%
- Brokerage _____%
- Other _____%

Insurance
- Life/Health _____%
- Property/Casualty _____%
- Agency _____%

Medical
- Hospitals _____%
- Physicians/Clinics _____%
- Other _____%

2B. Revenues from Cross-Industry Markets

VANs _____%
Electronic Mail _____%
EIS Data Bases
- Credit _____%
- Securities _____%
- Others _____%

2A. Revenues from Vertical Markets (con't)
(Based on U.S. Dept. of Commerce SIC Codes)

Education	_____%
Services (lawyers, accountants, etc.)	_____%
Federal Government	
- DoD	_____%
- Civil	_____%
State/Local Government	
- State	_____%
- Local	_____%
Other (construction, non-profit)	_____%
Consumer, Home Usage	_____%

E

Turnkey Systems

Please indicate the percentage of your U.S. last year's revenue from turnkey systems. (Total for Section 1 should equal 100% of those revenues. Totals for Section 2A **plus** 2B should also be 100%.)

Revenue Growth Last Year _____%

1. Turnkey Systems .....____%

a. Equipment .....____%
- Mainframe .....____%
- Minicomputer .....____%
- Workstation/PC .....____%

100%

b. Packaged Software .....____%
c. Customized Software .....____%
d. Other (Education, Training, Professional Services) .....____%

100%

2A. Revenues from Vertical Markets
(Based on U.S. Dept. of Commerce SIC Codes)

Discrete Manufacturing	_____%
Process Manufacturing	_____%
Transportation	_____%
Utilities	_____%
Telecommunications	_____%

2B. Revenues from Cross-Industry Markets

Planning/Analysis/ Spreadsheets	_____%
Accounting	_____%
Education/Training	_____%
Human Resources	_____%

2A. Revenues from Vertical Markets
(Based on U.S. Dept. of Commerce SIC Codes)

Retail Distribution	_____%
Wholesale Distribution	_____%
Banking and Finance	
- Commercial Banks	_____%
- Savings/Thrifts	_____%
- Brokerage	_____%
- Other	_____%
Insurance	
- Life/Health	_____%
- Property/Casualty	_____%
- Agency	_____%
Medical	
- Hospitals	_____%
- Physicians/Clinics	_____%
- Other	_____%
Education	_____%
Services (lawyers, accountants, etc.)	_____%
Federal Government	
- DoD	_____%
- Civil	_____%
State/Local Government	
- State	_____%
- Local	_____%
Other (construction, non-profit)	_____%
Consumer, Home Usage	_____%

2B. Revenues from Cross-Industry Markets

Engineering/Scientific/ CAD-CAM	_____%
Office Systems (Word Processing, E-Mail, Calendar, etc.)	_____%
Sales/Marketing	_____%
Publishing Systems	_____%
Graphics	_____%
Other	_____%

F
Professional Services

Please indicate the percentage of your U.S. last year's revenue from professional services. (Total for Section 1 should equal 100% of those revenues. Total for Section 2 should also be 100%.)

Revenue Growth Last Year _____%

1. Professional Services ..... _____%
- Consulting ..... _____%
- Education & Training ..... _____%
- Software Development ..... _____%
- Systems Operations (facilities management of client-owned systems) ..... _____%

100%

2. Revenues from Vertical Markets

(Based on U.S. Dept. of Commerce SIC Codes)

Discrete Manufacturing	_____%
Process Manufacturing	_____%
Transportation	_____%
Utilities	_____%
Telecommunications	_____%
Retail Distribution	_____%
Wholesale Distribution	_____%
Banking and Finance	
- Commercial Banks	_____%
- Savings/Thrifts	_____%
- Brokerage	_____%
- Other	_____%
Insurance	
- Life/Health	_____%
- Property/Casualty	_____%
- Agency	_____%
Medical	
- Hospitals	_____%
- Physicians/Clinics	_____%
- Other	_____%
Education	_____%
Services (lawyers, accountants, etc.)	_____%
Federal Government	
- DoD	_____%
- Civil	_____%
State/Local Government	
- State	_____%
- Local	_____%
Other (construction, non-profit)	_____%
Consumer, Home Usage	_____%
	100%

G
Systems Integration

Please indicate the percentage of your U.S. last year's revenue from systems integration. (Total for Section 1 should equal 100% of those revenues. Total for Section 2 should also be 100%.)

Revenue Growth Last Year _____%

1. Systems Integration ..... _____%
- Equipment ..... _____%
- Packaged Software ..... _____%
- Customized Software ..... _____%
- Professional Services (For Systems Integration Only) ..... _____%

100%

2. Revenues from Vertical Markets
(Based on U.S. Dept. of Commerce SIC Codes)

Discrete Manufacturing _____%
Process Manufacturing _____%
Transportation _____%
Utilities _____%
Telecommunications _____%
Retail Distribution _____%
Wholesale Distribution _____%
Banking and Finance
- Commercial Banks _____%
- Savings/Thrifts _____%
- Brokerage _____%
- Other _____%

Insurance
- Life/Health _____%
- Property/Casualty _____%
- Agency _____%

Medical
- Hospitals _____%
- Physicians/Clinics _____%
- Other _____%

Education _____%
Services (lawyers, accountants, etc.) _____%

2. Revenues from Vertical Markets (con't)

(Based on U.S. Dept. of Commerce SIC Codes)

Federal Government	
- DoD	_____%
- Civil	_____%
State/Local Government	
- State	_____%
- Local	_____%
Other (construction, non-profit)	_____%
Consumer, Home Usage	_____%
	100%